HEALTHY FOODSERVICE BENCHMARKING AND LEADING PRACTICES

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Executive Summary

In this report, we provide to the Department of Defense a plan for improving the food environment for Service Members, Military families, civilian employees, and retirees. We identify strategies and practices currently used by the foodservice industry to improve patron nutrition and eating behaviors. Next, we research and present the evidence base of those strategies and practices, and then outline steps the DoD can use to implement these evidence-informed strategies and practices in a Military setting. Some of the strategies and practices identified are used by foodservice venues (i.e., quick-service and casual-dining restaurants, clubs, cafeterias, snack bars, catering and vending machines); some strategies and practices are used by public and private sector organizations (i.e., locations where serving food is not a primary function) including schools and child-care facilities; and some are used by both foodservice venues and public and private sector organizations.

For this report, we conducted a comprehensive online search of practices utilized by various sectors of the foodservice industry aimed at improving consumer nutrition and eating behaviors. This generated a list of these practices, which we then categorized and organized into four main strategies:

(1) Offering some healthier options;
(2) Promoting healthier options;
(3) Making healthier options the default choice; and
(4) Making all options healthier.

After identifying these four strategies, we reviewed the literature for evidence of effectiveness in implementing these strategies. The purpose of the literature review was to research and present the existing evidence base of the identified practices using peer-reviewed research publications.

We identified and recommended a variety of practices with evidence of effectiveness. For foodservice venues, these included using organically grown varieties of the fruits and vegetables with the highest pesticide residue, and pasture-raised animal products; making healthier options the default choices; and using the specific practices found to be effective in promoting healthier options at the point of sale in cafeteria settings. For public and private sector organizations, these included using organically grown varieties of fruits and vegetables, and pasture-raised animal products; complying with the changes to the National School Lunch and School Breakfast Programs; continuing with the implementation of the new CDC nutrition standards; developing and enforcing competitive food

regulations (i.e., policy that is comprehensive, contains strong language, and targets multiple grade levels); using nutrition-related school-based programs designed to make all foods healthier or promote healthier foods; increasing the accessibility and desirability of free drinking water; and making healthier foods more visible, accessible, and desirable, as outlined by the Smarter Lunchrooms Movement. In addition, we identify a variety of practices that we recommend only with an examination their effectiveness, and that we recommend examining the effectiveness of in combination with other practices.

Background

Obesity is a leading public health concern in the United States. According to results from the most recent National Health and Nutrition Examination Survey, which assesses and tracks changes in the health and nutritional status of U.S. adults and children, obesity indicators within the population are alarming. More than one third of U.S. adults are now obese (Centers for Disease Control and Prevention, 2012a). In addition, the prevalence of obesity in 2- to 19-year-olds has nearly tripled since the 1980s to 17% (Centers for Disease Control and Prevention, 2012b).

The obesity epidemic impacts the U.S. Military as well as the general public. According to a report by *Mission: Readiness*, an organization comprised of retired Generals, Admirals, and civilian leaders of the U.S. Armed Forces, obesity is a threat to national security. An estimated 9,000,000 young adults (age 17 to 24) are too fat to serve in the U.S. Military. New recruits are more likely to be medically disqualified due to their overweight or obese weight status than for any other health concern. In fact, between 1995 and 2008, the proportion of new recruits failing their physical exams due to weight issues increased by approximately 70%. In addition, each year 1,200 first-term enlistees are discharged before the completion of their contracts due to weight problems (Christeson, Taggart, & Messner-Zidell, 2010).

The Department of Defense (DoD) is taking a lead role in reversing the obesity epidemic. In 2010, a childhood obesity working group was formed at the DoD to support the Obama administration's commitment to address the obesity epidemic in the U.S. The working group has identified a range of opportunities for obesity prevention, including the food environment. According to Barbara Thompson, co-chair of the working group, the following changes are ongoing:

- Child development center (CDC) menus are being standardized to ensure they meet the nutritional needs of the more than 200,000 young children served daily;
- Military officials are working with the vendors who supply food to CDCs to assure fresh vegetables, lower-fat meat, and less processed foods loaded with sugar, fats, and salt are supplied;
- Community gardening initiatives are being developed;
- Healthy cooking classes are being established;

- Commissary officials are working to reduce the number of products sold in commissaries that are high in fat, salt, and sugar and are striving to increase the number of fruits and vegetable offerings; and
- Military officials are working to increase healthy food choices in all on-base locales including: schools, dining facilities, clubs, bowling centers, food courts, and vending machines (Wilson, 2011).

At the 2012 annual Armed Forces Food and Beverage Training Workshop, Charles E. Milam, Principal Deputy Assistant Secretary of Defense for Military Community and Family Programs, highlighted that foodservice providers play a key role in promoting health. He added that the following foodservice initiatives are in progress:

- Policies are being adopted to provide healthier menu items in CDCs, schools, and dining facilities; and
- Military officials are encouraging contracted restaurants on installations (e.g., fast-food restaurants) to provide healthier options and are replacing establishments that don't comply (L. Daniel, 2012).

The strategies and practices outlined constitute a considerable start to addressing obesity issues by initiating changes to the vast and multi-faceted food environment of the U.S. Military. The Military's infrastructure is well-suited to instigating across-the-board adjustments to its food environment that could have wide-reaching effects. Further, the nation may look to the Military as a model on which to base initiatives at the federal level. Therefore, the Military has a crucial opportunity to create a cultural shift that will have a meaningful and lasting impact on the obesity epidemic affecting the Military and the nation.

The purpose of this report is to inform further initiatives of the DoD that will improve the health and nutritional status of Service Members, Military families, civilian employees, and retirees through changes to the DoD's foodservices. In this report, we will identify:

- **Leading foodservice venues**, which includes quick-service and casual-dining restaurants, clubs, cafeterias, snack bars, and vending machines; and evaluate the evidence base, if any, behind the strategies and practices each foodservice venue employs to improve nutrition and eating behaviors;
- **Leading public and private sector organizations** (i.e., locations where serving food is not a primary function, which includes schools and child-care facilities) and evaluate the evidence base, if any, behind the strategies and practices they use to provide healthful food venues and encourage healthy eating habits; and

- **Strategies and practices the DoD may utilize** to encourage healthy eating for Service Members, families, civilian employees, and retirees, on and off the installations.

Leading Foodservice Venues

For the purposes of this report, **foodservice venue** refers to a U.S. venue that exists for the purpose of serving food and includes quick-service and casual-dining restaurants, clubs, cafeterias, snack bars, catering, and vending machines. We will identify and examine the effectiveness of the strategies and practices that foodservice venues utilize to improve the nutrition and eating behaviors of their patrons. One critical distinction to address is the difference between making options *healthier* and making options *healthy*. For example, a restaurant may make their foods *healthier* by removing *trans* fats; however, those foods may not be *healthy* because they still contain a lot of calories, total fat, saturated fat, sodium, and/or sugar, and not contribute, in any meaningful way, toward one's dietary needs. We caution the reader to keep this distinction in mind when considering the effectiveness of the strategies and practices reviewed in this report.

Quick-service and casual-dining restaurants comprise the largest category of foodservice venue. According to recent census data, there are 271,912 quick-service and 225,873 full-service (including casual-dining) restaurants in the U.S. (United States Census Bureau, 2012; United States Department of Agriculture Economic Research Service, 2012b). Examples of quick-service restaurant chains include: Subway, McDonald's, Starbucks, Pizza Hut, Burger King, Dunkin' Donuts, Wendy's, Taco Bell, Kentucky Fried Chicken (KFC), Domino's Pizza, and Chick-Fil-A (i.e., these are the 10 largest chains when ranked by sales or number of locations). Examples of casual-dining restaurant chains are The Cheesecake Factory, BJ's Restaurants, Olive Garden Italian Restaurant, P.F. Chang's China Bistro, Cheddar's Casual Café, Ruth's Chris Steak House, Red Lobster, Texas Roadhouse, Roman's Macaroni Grill and T.G.I. Friday's (i.e., these are the 10 largest chains when ranked by sales) ("Chains Ranked by Estimated Sales per Unit by Segment," 2012).

Quick-service and casual-dining restaurants are located throughout the U.S. , including on Military bases (United States Department of Agriculture Economic Research Service, 2012a) (Figures 1 and 2). Thus, strategies employed by restaurants to improve the nutrition and eating behaviors of their patrons could have a wide-reaching effect.

Figure 1. Quick-service restaurants per county in 2009.

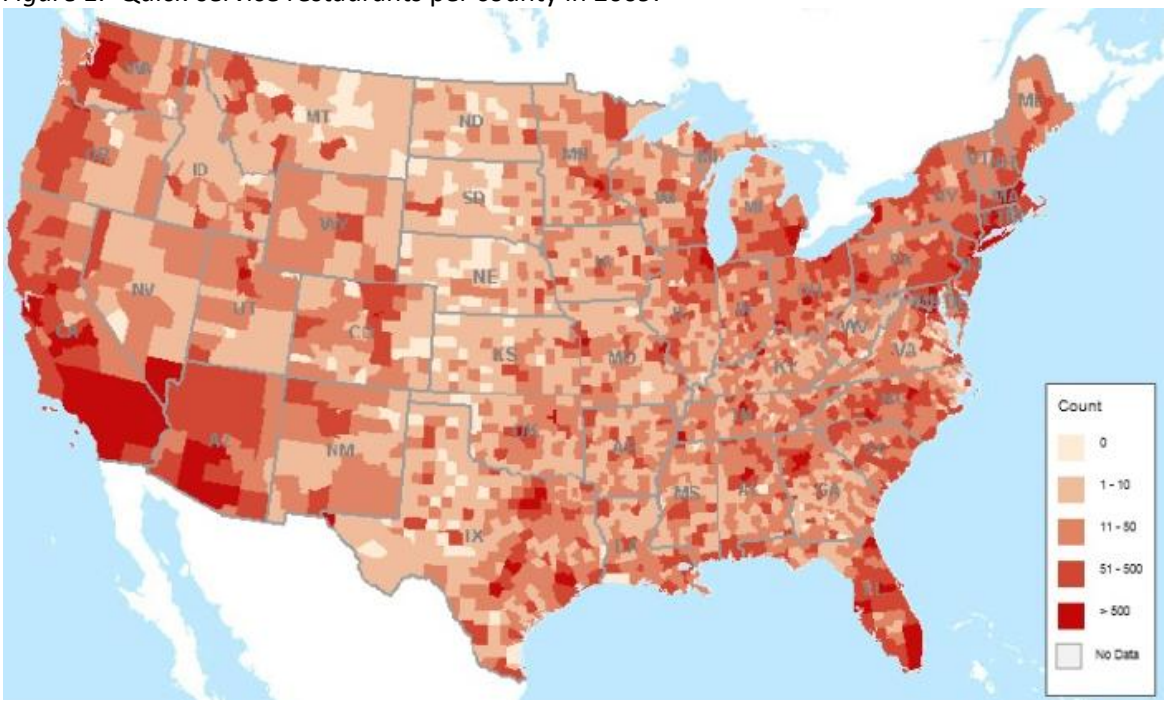
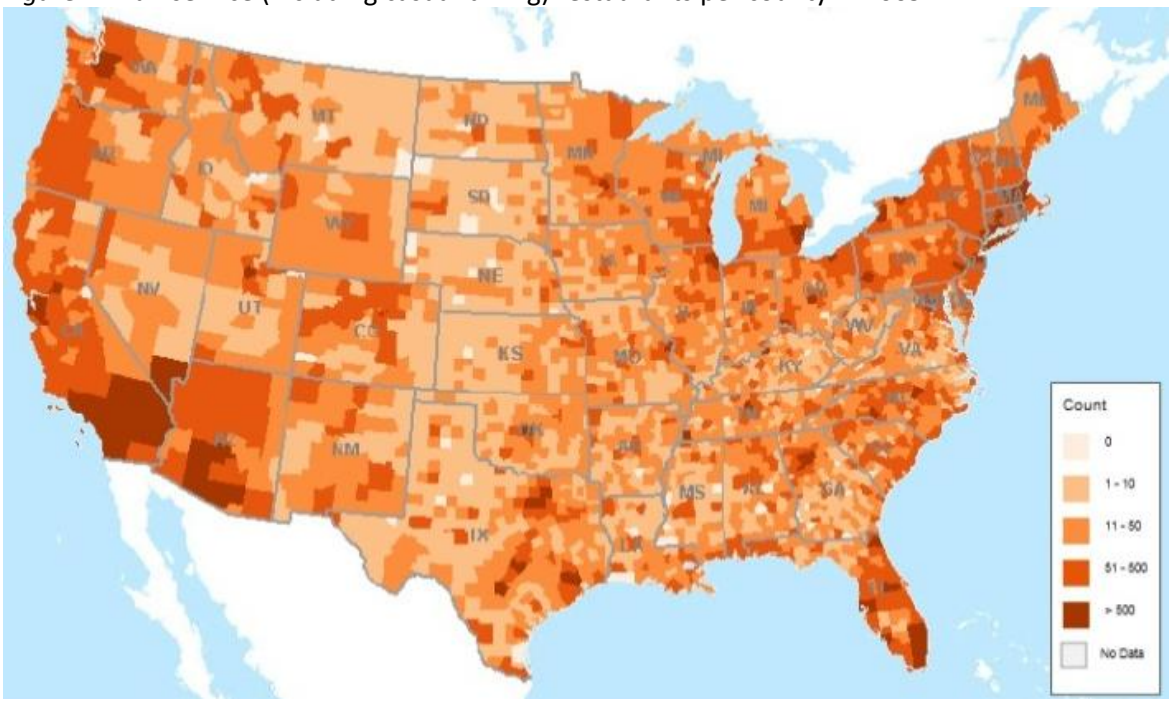


Figure 2. Full-service (including casual-dining) restaurants per county in 2009.

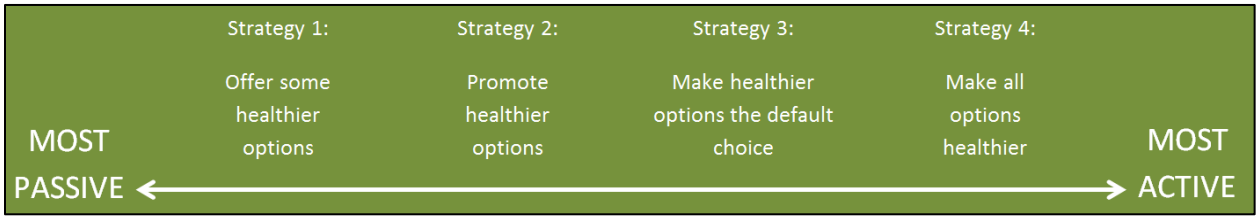


Vending machines, cafeterias, clubs, catering, and snack bars are smaller, yet important, sectors of the foodservice industry. Vending machines are the most prevalent of these remaining sectors, with an estimated 8,000 companies nationwide making $28 billion dollars in annual sales (National Automatic Merchandising Association, n.d.). Military base cafeterias, managed by the Military and companies such

as ARAMARK (Rolfsen, 2010) and Sodexo (P. Dolloffcrane, personal communication, October 25, 2012), serve a range of food offerings during their hours of operation to enlistees, other Military personnel, and, increasingly, to anyone on base, including retirees and civilians. Clubs, which are becoming less prominent on Military bases, have historically served food and drinks (including alcoholic beverages) to those with the rank of lieutenant and above (Copeland, 2009). Military caterers service a range of events that may include important guests such as senators, presidents, heads of state, and foreign dignitaries (Dodich, 2009). Snack bars, often found on base at recreational locations including bowling facilities and golf courses, serve a range of fare including pizza, burgers, salads, nachos, fries, chicken wings, soft drinks, and beer (U.S. Army MWR, n.d.-a, n.d.-b).

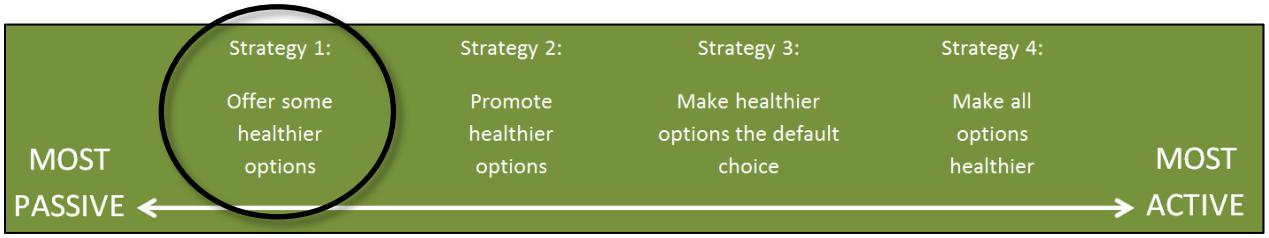
We identified four strategies used by foodservice venues to improve the nutrition and eating behaviors of their patrons. These strategies fall on a spectrum (Figure 3) from passive to direct.

Figure 3. A spectrum of strategies foodservice venues use to improve nutrition and eating behaviors.



On the following pages, we provide an account of the practices most commonly used by foodservice venues to accomplish these four strategies, and we evaluate the effectiveness of those practices at improving consumer nutrition and eating behaviors.

Strategy 1: Offer Some Healthier Options



Strategy 1 (Offer Some Healthier Options): Practices

1. Making healthier options available,

2. Labeling Menus, and

3. Using technology to make food information available.

PRACTICE 1: MAKING HEALTHIER OPTIONS AVAILABLE

For many years, quick-service and casual-dining restaurants have touted the wide variety of their food offerings as their primary method of considering the nutritional needs of their patrons. Indeed, at most foodservice venues, healthier options are available alongside less-healthy fare. Some of these options are healthier because they are lower in calories. Lower-calorie options have smaller portion sizes and/or a lower energy density (i.e., fewer calories in a given weight of food). Other options are healthier because of their favorable nutrient composition (e.g., whole-grain foods and *trans* fat-free foods).

Practice 1 Evidence. Empirical evidence reveals that weight reduction can be achieved by consuming fewer calories. Eating smaller portions and less energy-dense foods have both been shown to promote a healthy weight (Ello-Martin, Ledikwe, & Rolls, 2005). Adults and children are more likely to eat a constant weight of food rather than a constant number of calories (Rolls, Drewnowski, & Ledikwe, 2005; Spill, Birch, Roe, & Rolls, 2011). This finding indicates that consuming smaller portions may result in compensating with additional food at a later time; however, consuming foods with a lower energy density may not create this situation. Therefore, reducing energy density may be a more effective method for reducing caloric intake than reducing portion size.

In addition, evidence suggests that not all calories are created equal, and the nutrient composition of a person's diet impacts their metabolism (Agus, Swain, Larson, Eckert, & Ludwig, 2000; Ebbeling et al., 2012; Pereira, Swain, Goldfine, Rifai, & Ludwig, 2004). Studies indicate that when adults consume a standard low-fat diet, which is rich in carbohydrates, they burn less energy at rest than adults who consume a low-glycemic index diet, which has moderate amounts of fat and low-glycemic index (GI) carbohydrates (i.e., carbohydrate-containing foods that promote a steady blood sugar level because they are low in refined carbohydrates and/or contain dietary fiber and/or fat). Weight loss and weight maintenance are promoted by burning more energy at rest.

However, providing healthier foods alongside less-healthful options does not mean healthier foods will be purchased or consumed. While some consumers may seek healthy options when eating out, according to research, most people value taste and price above nutrition (Elbel, Gyamfi, & Kersh, 2011; Glanz, Basil, Maibach, Goldberg, & Snyder, 1998; Harnack et al., 2008).

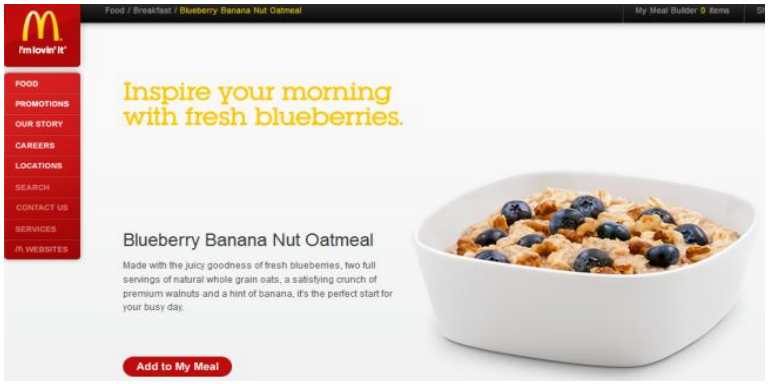
Practice 1 Examples. Examples below illustrate specific ways foodservice venues make healthier options available:

- The Cheesecake Factory offers portion-controlled "Small Plates" options and an entire "Skinnylicious®" menu, (Figure 4) which features foods and beverages that have reduced calories due to a combination of lower energy density and portion sizes (TFC Co LLC, 2011).

Figure 4. SkinnyLicious® and Small Plates options featured on The Cheesecake Factory's website.

- Breakfast oatmeal at quick-service restaurants like Starbucks (Starbucks Corporation, 2012b) and McDonald's (McDonald's, 2012b) (Figure 5) have a healthier nutrient composition than many of their other breakfast offerings. Oatmeal is a whole grain that provides dietary fiber and a range of vitamins. The accompanying fruits and nuts provide dietary fiber, vitamins, and healthy fats.

Figure 5. Breakfast oatmeal offerings from Starbucks and McDonald's.



Starbucks® Perfect Oatmeal

- Dining establishments offer a choice of sides. At Red Lobster, one can choose between Fresh Broccoli, Home-Style Mashed Potatoes, Wild Rice Pilaf, Baked Potato, or Fries. Choosing broccoli saves a restaurant patron between 135 to 285

Figure 6. Nutrition information for sides offered at Red Lobster.

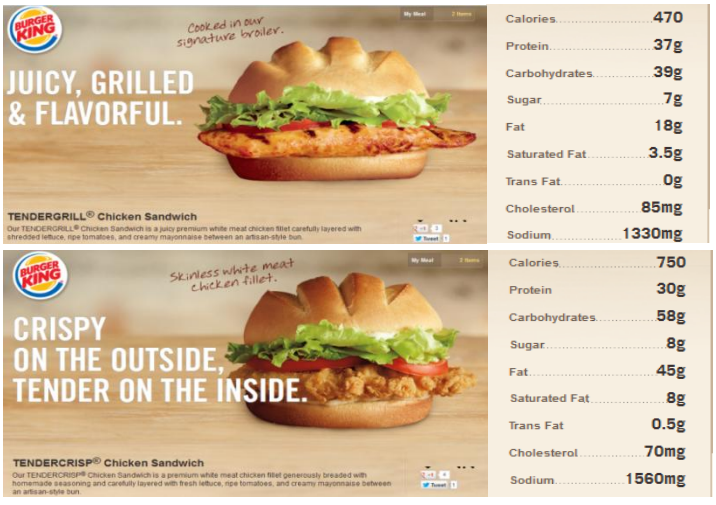
*Nutritional content does not include condiments, dipping sauces or optional accompaniments. *Regional item, availability varies.*	Calories	Total Fat (g)	Sat. Fat (g)	Protein (g)	Sodium (mg)	Carb. (g)
Fresh Broccoli	45	0.5	0	4	200	6
Home-Style Mashed Potatoes	210	10	6	5	620	27
Wild Rice Pilaf	180	3	0.5	4	650	34
Baked Potato	220	1	0	5	730	47
Add Butter	90	10	6	0	80	1
Add Sour Cream	30	2.5	1.5	0	10	1
Fries	330	17	1.5	4	740	40

calories (Figure 6) because of its more favorable energy density (Red Lobster, n.d.). At Wendy's, choosing a small chili, with an energy density of 0.9 calories per gram, instead of a Small French Fries, with an energy density of 3.0 calories per gram, provides the patron with fewer calories and a better nutrient composition with less saturated fat and more protein and dietary fiber than the fries (Oldemark LLC., 2012) (Figure 7).

Figure 7. Nutrition information for fries and chili at Wendy's.

- When a food's preparation method uses less fat (e.g., baking, grilling, or broiling instead of frying or sautéing), the resulting food often has fewer calories. For example, at Burger King the Tendercrisp® and Tendergrill® Chicken Sandwiches (Figure 8) differ in their preparation method; one is grilled and the other is fried. The grilled sandwich has 280 less calories and 27 less grams of fat (including 4.5 less grams of saturated fat).

Figure 8. Nutrition comparison of the Tendergrill® and Tendercrisp® Chicken Sandwiches atBurger King.



Practice 1 Summary. Evidence indicates that consuming foods with fewer calories (especially because of a reduced energy density) and a lower glycemic index promotes a healthy weight. However, evidence does not support the idea that making healthier options available improves nutrition or eating

behaviors. Therefore, ***we cannot recommend the practice of making healthier choices available, on its own, as an effective means of improving nutrition or eating behaviors.***

PRACTICE 2: MENU LABELING

Restaurants have, historically, emphasized that consumers have choice and responsibility when it comes to their nutrition and eating behaviors. For example, the following statement comes from a McDonald's spokesperson:

> "Today, we offer more variety than ever in our menu and we trust that our customers will make the appropriate choices for them, their families and lifestyles." (Gordon, 2012)

In order to identify and choose healthier options, foodservice venue patrons need to be provided with nutrition information on which to base their decisions (e.g., menu labeling). To date, nutrition information has rarely been available to the patrons of foodservice venues at the point of sale. However, this situation is changing because of voluntary efforts by some companies and menu labeling laws. These determinations will impact many quick-service and casual-dining restaurant chains and vending machine operators.

Practice 2 Evidence. Evidence is mixed regarding the effectiveness of menu labeling on improving the eating behavior of consumers. Data from New York City, which imposed city-wide menu-labeling regulations in chain restaurants on May 5, 2008, (New York City Department of Health & Mental Hygiene, n.d.) indicate that menu labeling does not significantly impact the purchasing behaviors of the entire population; however, it may improve the purchasing behaviors of consumers at specific restaurants. In addition, these regulations may help the subset of consumers who use the labeled menus to purchase fewer calories. A pair of studies investigating food-purchasing behaviors in New York City before and after menu labeling went into effect found that consumers purchased an average of 827 lunch calories at fast-food restaurants before menus were labeled (Dumanovsky, Nonas, Huang, Silver, & Bassett, 2009); this figure did not change significantly after menu labeling was introduced (Dumanovsky et al., 2011). The latter of these two studies found that more calories were purchased at Subway and fewer calories were purchased at McDonald's, Au Bon Pain, and KFC after menu labeling went into effect. In addition, the 15% of consumers who indicated that they used the posted calorie information purchased an average 106 fewer calories than consumers not using the calorie information.

Consumers using the labeled menus were *less* likely to be men, *less* likely to be 18- to 24-year-olds, and *less* likely to be in low-income areas. Another pair of studies examined the fast-food purchasing behaviors of consumers in low-income areas of New York City and Newark, NJ. The first of these studies found that menu labeling did not significantly alter the number of calories adult consumers purchased, even among individuals who noticed menu labels and indicated that the labels influenced their food choice (Elbel, Kersh, Brescoll, & Dixon, 2009). The second study found that menu labeling did not significantly influence the purchasing behaviors of adolescent consumers or parents purchasing foods for their children (Elbel et al., 2011).

Evidence from a laboratory setting allows for further interpretation of the effects of menu labeling on consumer eating behavior and nutrition when it includes data about the number of calories consumed as well as purchased. The results of one such study suggest that menu labeling reduces the number of calories ordered and consumed at a single meal, but when the number of calories consumed from the meal and later snacking are combined, the reduced calorie consumption only remains significant for research participants whose menus contain the statement, "The recommended daily caloric intake for an average adult is 2000 calories" (Roberto, Larsen, Agnew, Baik, & Brownell, 2010). However, this finding was not confirmed by another laboratory-based study, which found no significant difference in the number of calories ordered or consumed by research participants given menus with and without caloric information and a statement that most women "need less than 2000 calories in a day" and most men "need less than 2400 calories in a day" (Harnack et al., 2008).

In some cafeteria settings, consumer purchasing behavior improved when nutrition information was made available (Davis-Chervin, Rogers, & Clark, 1985), but in other cases nutrition information availability had no effect (Mayer, Brown, Heins, & Bishop, 1987) or even resulted in consumers purchasing less-healthy foods (Aron, Evans, & Mela, 1995). Of particular interest, data were collected in an Army cafeteria where the calorie, fat, and cholesterol content of entrees were posted on 3 x 5 cards next to the entree as part of a campaign to encourage healthier eating. The study found no effect of making nutrition information available on the consumer's purchasing behavior. The majority (79%) of study participants indicated that the information did not influence their meal selection. Further, participants ranked taste, appearance, and quality as more important factors than calorie and fat content when choosing a meal (Sproul, Canter, & Schmidt, 2003).

We were only able to identify one study on the purchasing behavior of consumers using vending machines with posted nutrition information. Study findings indicated that the sale of lower-calorie

offerings was influenced more by their availability within the study vending machines (i.e., what foods were available for purchase) than by the posting of nutrition information (Wilbur, Zifferblatt, Pinsky, & Zifferblatt, 1981).

Practice 2 Examples. On March 23, 2010, the Patient Protection and Affordable Care Act was signed into law. Section 4205 of the Act, "Nutrition Labeling of Standard Menu Items in Restaurants and Similar Retail Food Establishments", will require restaurants with 20 or more locations to:

- Post the calorie counts of standard menu items on all menus and menu boards;
- Post a statement suggesting daily caloric intake (e.g., "A 2,000 calorie diet is used as the basis for general nutrition advice; however, individual calorie needs may vary");
- Post a statement indicating to consumers that additional nutrition information is available upon request; and
- Make available, upon request, the total calories, calories from fat, total fat, saturated fat, cholesterol, *trans* fat, sodium, total carbohydrates, sugars, dietary fiber, and protein (U.S. Food and Drug Administration, 2011).

Vending machine operators with ≥ 20 vending machines also fall under the new regulations of the Patient Protection and Affordable Care Act. They are mandated to post caloric information for foods in vending machines when the nutrition information for individual packages inside the machine isn't visible to consumers (U.S. Food and Drug Administration, 2011).

The U.S. Food and Drug Administration (FDA) has proposed rules to guide the adoption of this policy and is currently in the process of accepting and reviewing comments submitted by the public before finalizing regulations. Ahead of this policy, several state and local governments introduced bills to require menu labeling within their jurisdictions with a smaller number passing such bills into law or proceeding with their implementation (Center for Science in the Public Interest, 2010).

Clubs, cafeterias, caterers, and snack bars are not required under the Patient Protection and Affordable Care Act to make calorie or other nutrition information available, and the cost of determining such information likely deters most venues from making it available. Nevertheless, we did locate occasions when cafeterias, including one Army cafeteria, tried to promote wellness by posting nutrition information for their offerings (Aron et al., 1995; Davis-Chervin et al., 1985; Mayer et al., 1987; Sproul et al., 2003).

Practice 2 Summary. Evidence is mixed regarding the effectiveness of labeling menus and posting nutrition information. Doing so will likely not alter the purchasing or eating behavior of most consumers; however, a subset of consumers may use the information to make healthier purchases. Further, the addition of a statement drawing consumers' attention to their daily caloric needs may deter some from consuming compensatory calories later in the day. Therefore, labeling menus and posting nutrition information should be coupled with efforts to draw consumers' attention to their daily caloric intake. At this time, ***we cannot recommend the practice of menu labeling, on its own, as an effective means of improving nutrition or eating behaviors; however, we recommend examining the effectiveness of this practice in combination with other practices.***

PRACTICE 3: USING TECHNOLOGY TO MAKE FOOD INFORMATION AVAILABLE

Many restaurants provide access to nutrition information on their websites. Navigating to nutrition information from some restaurant homepages can be tricky, but other restaurants make nutrition information easily accessible. Similarly, some restaurants provide bare lists of nutrition information while others present the information in a more user-friendly format. A growing number of restaurant chains are also taking advantage of the popularity of smartphones and tablet computers and making nutrition information available via apps. As was true for web content, some restaurant apps present nutrition information in more user-friendly ways than others.

Nutrition information available via websites or smartphone/tablet apps are not readily accessible for all patrons of quick-service or casual-dining restaurants. Viewing website content requires a computer and internet access. Apps are accessible to an even smaller population. One must own the appropriate tablet or smartphone for access (e.g., iPad and iPhone). These methods of accessing nutrition information are novel and convenient for some restaurant patrons but not a reasonable format for the general population. The quick-service restaurant chain, Au Bon Pain, is the only foodservice venue we identified that has made technology-based nutrition information available to all patrons. Each store has a nutrition center featuring a kiosk that Au Bon Pain customers may use to access the restaurant's online nutrition information.

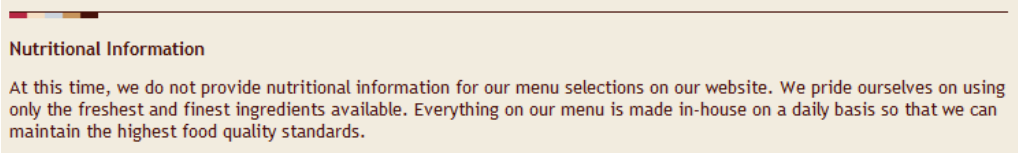
Practice 3 Evidence. We could not locate evidence of the effectiveness of providing site-specific, technology-based nutrition information on the improved nutrition or eating behaviors of

restaurant patrons. Further, such presentations of information are not accessible to some restaurant patrons.

Practice 3 Examples. Here is a sampling of what we found when we searched for nutrition information on the websites of the largest quick-service and casual-dining chains:

- No nutrition information on The Cheesecake Factory's website (TCF Co. LLC, 2011) (Figure 9);

Figure 9. Nutrition information statement from The Cheesecake Factory.

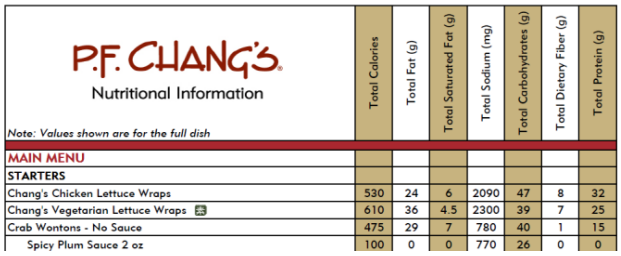


Nutritional Information

At this time, we do not provide nutritional information for our menu selections on our website. We pride ourselves on using only the freshest and finest ingredients available. Everything on our menu is made in-house on a daily basis so that we can maintain the highest food quality standards.

- A 10-page list of menu items and the items' corresponding nutrient content on the P.F. Chang's website that is linked from the menu page rather than the homepage (P.F. Chang's China Bistro Inc., 2010) (Figure 10);

Figure 10. A sample from P.F. Chang's online nutritional information.

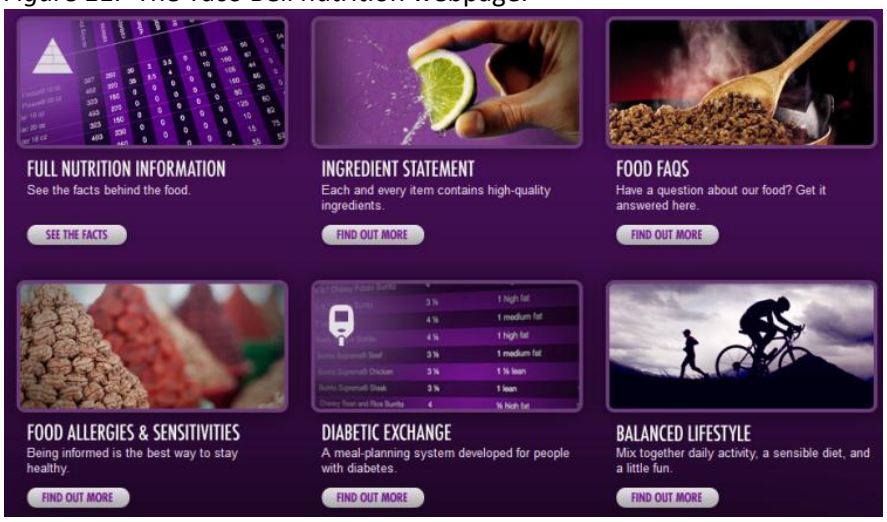


P.F. CHANG'S
Nutritional Information

Note: Values shown are for the full dish	Total Calories	Total Fat (g)	Total Saturated Fat (g)	Total Sodium (mg)	Total Carbohydrates (g)	Total Dietary Fiber (g)	Total Protein (g)
MAIN MENU							
STARTERS							
Chang's Chicken Lettuce Wraps	530	24	6	2090	47	8	32
Chang's Vegetarian Lettuce Wraps	610	36	4.5	2300	39	7	25
Crab Wontons - No Sauce	475	29	7	780	40	1	15
Spicy Plum Sauce 2 oz	100	0	0	770	26	0	0

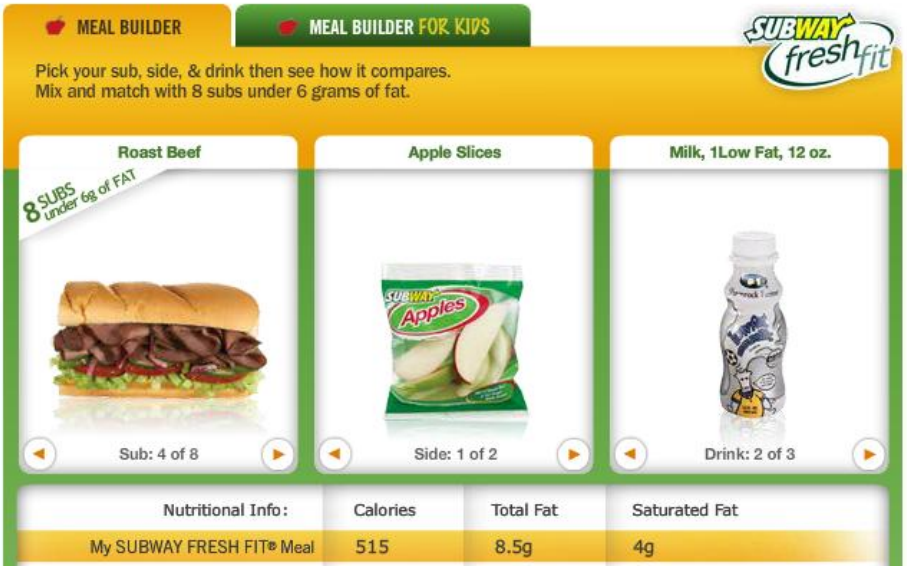
- A nutrition webpage was found that is simple to access from the Taco Bell homepage, and the webpage contains a variety of nutrition topics including nutrient content, ingredients, allergens, and diabetic exchange (Taco Bell Corp., 2012) (Figure 11); and

Figure 11. The Taco Bell nutrition webpage.



- A nutrition webpage was located that is simple to access from the Subway homepage and a user-friendly, interactive "Meal Builder" application (Figure 12) that allows users to see how different options change the overall nutrition of their meal was also found (Doctor's Associates Inc., n.d.).

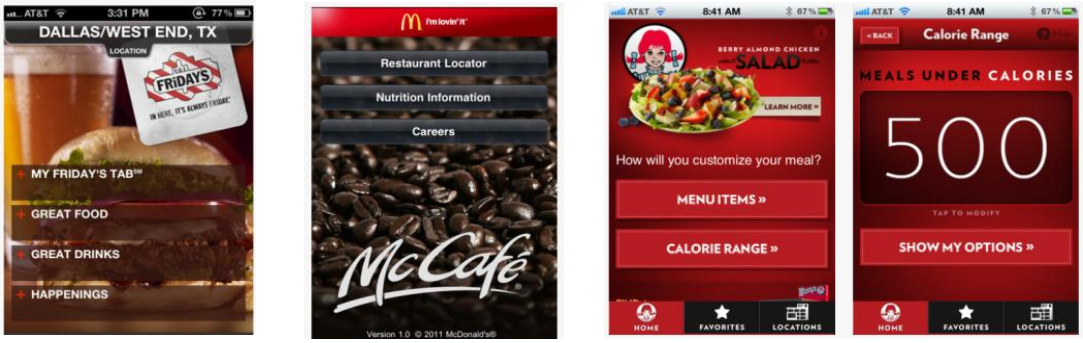
Figure 12. Subway's Meal Builder nutrition application.



Here is a sampling of what we found when we looked for nutrition information on apps from the largest quick-service and casual-dining venues (Figure 13):

- No nutrition information on the T.G.I. Friday's app (Apple Inc., 2012a);
- Nutrition information searchable from the homepage of the McDonald's app (Apple Inc., 2012b); and
- A feature from Wendy's that allows its app users to search for meals within a certain caloric range(Apple Inc., 2012c).

Figure 13. The T.G.I. Friday's, McDonald's, and Wendy's iPhone apps.

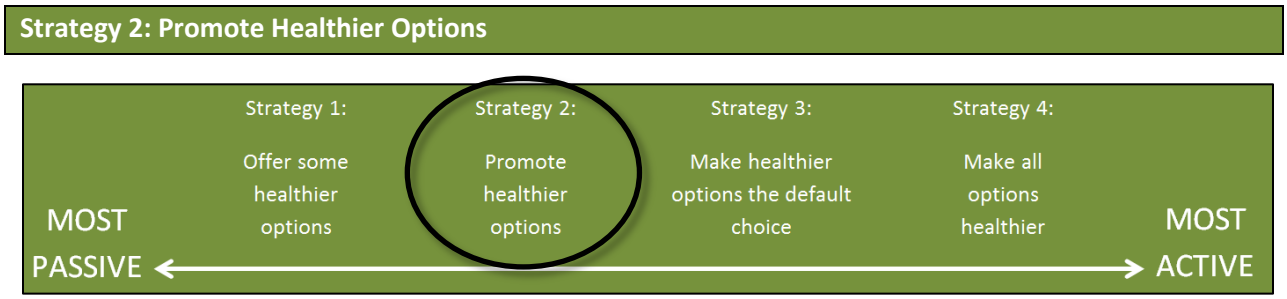


The quick-service restaurant chain, Au Bon Pain, was the only company we were able to identify that has made technology-based nutrition information available to all of its patrons via in-store nutrition kiosks (Figure 14). The nutrition information accessible from the kiosks includes: the complete nutrient content and ingredient list for each menu item, information about which foods contain common allergens, and a "my plate" meal builder application. This application allows users to sort menu options by calorie, saturated fat, sodium, carbohydrate, cholesterol, protein, or fiber content, and allows users to view the nutrition information and allergen content of different combinations of menu items (ABP Corporation, 2012a).

Figure 14. Nutrition content from the in-store kiosks at Au Bon Pain.

Practice 3 Summary. Restaurant-specific, technology-based nutrition information is becoming widely available to patrons who have access to the internet or smartphones. Currently, evidence does not suggest that these methods of providing nutrition information result in improved patron nutrition or eating behaviors. In addition, these technology-based methods cannot impact the general population until technology is more widely available and accessible. Given the speed of technology innovation, and its rapid adoption by leading food chains to provide user-friendly information, this is an area that holds potential for improving consumer purchasing behavior. At this time, ***we cannot recommend the practice of using technology to make food information available, on its own, as an effective means of***

improving nutrition or eating behaviors; however, we recommend examining the effectiveness of this practice in combination with other practices.



Strategy 2 (Promote Healthier Options): Practices

1. Promoting healthier options at the point of sale,

2. Promoting healthier options outside of the point of sale occasions, and

3. Joining the Healthy Dining or Kids LiveWell programs.

PRACTICE 1: PROMOTING HEALTHIER OPTIONS AT THE POINT OF SALE

A preferable option to the passive strategy of offering healthier food options is to promote those healthier choices. This strategy is accomplished at and outside the point of sale. The point of sale may be a vending machine, a cafeteria line, a table where a patron gives his or her selection to a waiter, a cashier's counter, a drive-thru window, a phone where orders are made, or, increasingly, a website or tablet/smartphone app where online orders are placed. Each of these locations provides foodservice vendors with the opportunity to highlight healthier menu options.

Practice 1 Evidence. We could not locate evidence of the effectiveness of promoting healthier options at the point of sale at most foodservice venues with regard to customer nutrition or eating behaviors. However, cafeterias have had success promoting healthier options at the point of sale in a variety of ways. In one instance, a sign at the entrance to a worksite cafeteria prompted consumers to look for a heart symbol to identify low-fat entrees; the corresponding entrees in the cafeteria were marked with a heart symbol. Resulting sales of low-fat items significantly increased (Levin, 1996). In a

second instance, a hospital cafeteria labeled its offerings with red (i.e., unhealthy), yellow (i.e., less-healthy) and green (i.e., healthy) labels designed to correspond with the USDA's 2005 MyPyramid guide. Doing so resulted in a significant decrease in the sale of red items (i.e., by 9.2%) and a significant increase in the sale of green items (i.e., by 4.5%). A large proportion of this change was due to beverage selection; red beverage sales decreased by 16.5% while green beverage sales increased by 9.6%. (Thorndike, Sonnenberg, Riis, Barraclough, & Levy, 2012). In school cafeterias, highlighting vegetable and fruit offerings by creatively naming vegetable dishes (Wansink, Just, Payne, & Klinger, 2012) and prompting students to take a piece of fruit or 100% fruit juice with their lunch (Schwartz, 2007) significantly increased the consumption of vegetables, fruits, and juice. Making healthy fare easier or more convenient to access has also been successful. In a hospital cafeteria, for example, putting healthier foods in more conspicuous locations resulted in significantly more purchases of the healthy choices (Thorndike et al., 2012). A similar practice was used effectively in school cafeterias; when healthy lunch choices were promoted by making them available in convenience lines, students consumed more of the convenient healthy foods (Hanks, Just, Smith, & Wansink, 2012).

Practice 1 Examples. At some restaurants, menus and menu boards feature icons signifying that menu items have certain characteristics (e.g., that they are vegetarian or low-calorie). For example, Dunkin Donuts uses a "DDSMART®" logo (DD IP Holder LLC, 2011) (Figure 15) to make their customers aware of lower-calorie choices. Other restaurants designate certain sections of their menu or have entirely separate menus devoted to healthier fare. For example, a section of the BJ's Restaurants menu features "Enlightened Entrees®" that are lower in calories than the rest of their menu items (BJ's Restaurants Inc., 2012), and patrons seeking reduced-calorie options at The Cheesecake Factory can order off of their "Skinnylicious®" menu (TFC Co LLC, 2011) instead of their traditional menu (Figure 4).

Figure 15. The DDSMART® logo.

Some vending machine operators also promote healthy options at the point of sale. The National Automatic Merchandising Association developed a voluntary program called Fit Pick™ that allows operators to use sticker labels to designate healthier vending machine choices (Figure 16) (Fit Pick, 2011). Qualifying products must have < 35% of calories from fat and < 10% of calories from saturated fat, and sugar must make up < 35% of the total package weight. According to the Fit Pick™ website, as of

Figure 16. The Fit Pick™ logo.

2010 there were 1,215 organizations registered with the program. The Army and Air Force Exchange Service is one such organization. Currently, 50% of snacks in vending machines in this organization meet Fit Pick™ standards.

We found that the largest variety of point-of-sale healthy food promotions has been used by cafeterias. Cafeterias have promoted healthier options by making them more conspicuous (Thorndike et al., 2012), making them more convenient to purchase (Hanks et al., 2012), drawing consumer attention to them by word of mouth (Schwartz, 2007) or by labeling them with symbols (e.g., a heart to designate that a dish is heart-healthy) (Levin, 1996; Thorndike et al., 2012), and making them more appealing to consumers by giving them creative names (Wansink et al., 2012).

Practice 1 Summary. Promoting healthier options at the point of sale has been used by restaurants and vending machine companies, where studies of its effectiveness are limited, and used by cafeterias, where it has been found to improve purchasing and eating behaviors. ***We recommend using the specific practices found to be effective in promoting healthier options at the point of sale in cafeteria settings in Military cafeterias, and we recommend examining their effectiveness in other foodservice venue settings.***

PRACTICE 2: PROMOTING HEALTHIER OPTIONS OUTSIDE OF POINT OF SALE OCCASIONS

Highlighting healthier options outside of the point of sale may be less preferable because customers aren't prompted to notice the healthier choices available while making their food choice. Nevertheless, we identified some quick-service venues that use print materials given with meals to help raise awareness about healthier options. Advertising campaigns featuring healthier menu options are another means of promoting healthier menu items outside of the point of sale. Advertisements come in a number of formats, such as billboards, print ads in magazines, sidebar ads on websites, and television commercials.

Practice 2 Evidence. We could not locate any evaluations of the effectiveness of promoting healthier food options outside of the point of sale on consumer purchasing behavior.

Practice 2 Examples. Some quick-service venues give print materials with meals that promote healthier options. For example, the napkins given with meals at Subway are printed with information

about menu items containing ≤ 6 grams of fat. Similarly, Burger King promotes adult meal combinations with ≤ 650 calories on tray liners for special promotions that eat-in customers can view while they sit and eat (Burger King Corporation, n.d.).

Advertising campaigns are another means of promoting healthier options outside of the point of sale. We personally noted the use of such advertising campaigns in early January when patrons are motivated to make choices that support their New Year's resolutions. Further, we spoke with a nutrition researcher who collaborated with a major food company (M. Zack, personal communication, October 16, 2012) and confirmed that the company sought to advertise the health attributes of their foods during the New Year season. We did not locate any examples of other foodservice venue types advertising healthy options outside of point-of-sale occasions.

Practice 2 Summary. Although a variety of ways exist for quick-service and casual-theme restaurants to promote healthier food options outside of the point of sale, no empirical studies were found that evaluated the effectiveness of such promotions on consumer nutrition or eating behaviors. However, the effect of food marketing, in general, on consumer purchasing behavior is well-established (Harris et al., 2010); so advertising campaigns designed to influence healthier consumer purchasing behavior may hold promise and should be explored further. At this time, ***we cannot recommend the practice of promoting healthier options outside of the point of sale, on its own, as an effective means of improving nutrition or eating behaviors; however, we recommend examining the effectiveness of this practice in combination with other practices, and we recommend examining the effectiveness of advertising campaigns designed to influence healthier consumer purchasing behavior.***

PRACTICE 3: JOINING THE HEALTHY DINING OR KIDS LIVEWELL PROGRAMS

The Healthy Dining and Kids LiveWell programs combine point-of-sale and non-point-of-sale promotional strategies. In March 2007, the National Restaurant Association (NRA) partnered with the company Healthy Dining to launch the Healthy Dining Finder website. The website, which was developed with partial funding from the Centers for Disease Control and Prevention, helps consumers identify restaurants that offer food choices meeting specific nutritional guidelines for adults:

- Qualifying entrées must have
  - ≤ 750 calories;

  - ≤ 25 grams of fat, and ≤ 8 grams of saturated fat; and
  - ≥ 2 sources of fruit (i.e., ≥ ½ cup), vegetables (i.e., ≥ ½ cup), whole grains, lean protein (i.e., ≥ 3 oz skinless white meat poultry, fish, seafood, beef, pork, or tofu, or ≥ 1 egg or egg equivalent, or ≥ 1 oz nuts, seeds, dry beans, or peas), or lower-fat dairy (i.e., ≥ ½ cup 1% or skim milk and non-cheese dairy products); and
- Qualifying individual items (e.g., appetizers, side dishes, and desserts) must have
  - ≤ 250 calories; and
  - ≤ 8 grams of fat, and ≤ 3 grams of saturated fat (Healthy Dining, 2012c).

In July 2011, Healthy Dining introduced a similar set of nutritional guidelines for children called the Kids LiveWell program. Participating restaurants must:

- Offer at least one full children's meal (i.e., entrée, side, and beverage) that has
  - ≤ 600 calories;
  - ≤ 35% of calories from total fat, ≤ 10% of calories from saturated fat, and < 0.5 grams of artificial *trans* fat;
  - ≤ 35% of calories from total sugars (i.e., both added and naturally-occurring sugars);
  - ≤ 770 milligrams of sodium; and
  - ≥ 2 sources of fruit (i.e., ≥ ½ cup, which includes 100% juice), vegetables (i.e., ≥ ½ cup), whole grains (i.e., ≥ ½ cup), lean protein (i.e., ≥ 2 oz skinless white meat poultry, fish, seafood, beef, pork, or tofu, or ≥ 1 egg or egg equivalent, or ≥ 1 oz nuts, seeds, dry beans, or peas), or lower-fat dairy (i.e., ≥ ½ cup 2%, 1% or skim milk and dairy products);
- Offer at least one other individual item that has
  - ≤ 200 calories;
  - the same fat and sugar requirements listed above;
  - ≤ 250 milligrams of sodium; and
  - ≥ 1 source of the food groups listed above;
- Make available or post the nutrition information of qualifying Kids LiveWell menu items; and
- Identify or promote qualifying Kids LiveWell menu items (National Restaurant Association, 2012).

The Healthy Dining and Kids LiveWell websites and free iPhone apps help users locate nearby participating restaurants and identify qualifying Healthy Dining or Kids LiveWell menu items at those restaurants. In some cases, users are prompted with "special request" ordering instructions (e.g., "request no butter", or "request a side of steamed vegetables instead of fries") to modify menu items so that they qualify (Healthy Dining, 2007). Participating restaurants receive placement on the directory of

and promotion by Healthy Dining or Kids LiveWell, and they receive the authorization to use the Healthy Dining or Kids LiveWell icon on their menus to highlight qualifying menu items.

Practice 3 Evidence. The effect of restaurant participation in Healthy Dining and Kids LiveWell on the improvement of consumer nutrition and eating behaviors has not been evaluated. To date, there are no investigations that establish whether restaurant participation is associated with menu adaptations resulting in healthier options or customer purchase or consumption of healthier menu options.

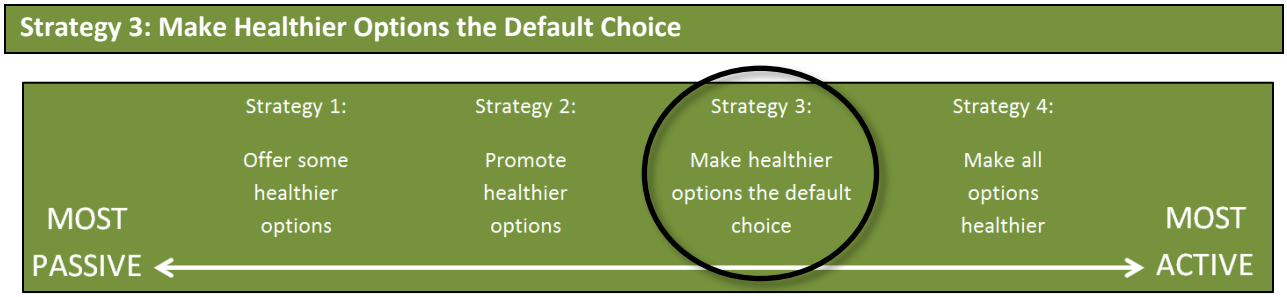
Healthy Dining and Kids LiveWell programs identify restaurant menu choices that already meet their nutrition criteria (Healthy Dining, 2012a); thus, some participating restaurants may make no improvements to their menu. However, the programs also offer consultations to modify recipes (Healthy Dining, 2012a); therefore, some restaurants may improve their menus in order to increase their number of qualifying Healthy Dining or Kids LiveWell menu items.

No empirical evidence exists that establishes whether the patrons of restaurants participating in programs like Healthy Dining and Kids LiveWell make healthier purchases as a result of that participation. If an impact did exist, it would be for a minority of patrons who use nutrition information to guide their choices and also use the Healthy Dining or Kids LiveWell websites and/or apps. The Kids LiveWell program, in particular, is not likely to have a large impact because parents who order fast food for their children order from the kids meal menu only 36% of the time for their children under age 6 years and 21% of the time for their 6- to 12-year-old children (Harris et al., 2010).

Practice 3 Examples. Hundreds of restaurants have joined the Healthy Dining program, including some of the largest casual-dining chains identified above: BJ's Restaurants, Olive Garden Italian Restaurant, Red Lobster, and Roman's Macaroni Grill (Healthy Dining, 2012d). Similarly, at its one-year anniversary in July 2012, Kids LiveWell reported having more than 100 participating restaurant brands (Hensley & Niebaum, 2012). These include two of the largest quick-service venues, Burger King and Chick-Fil-A, and one of the largest casual dining chains, BJ's Restaurants, is listed as "coming soon"(Healthy Dining, 2012b).

Practice 3 Summary. When restaurants participate in programs focused on promoting healthy eating (e.g., Healthy Dining and Kids LiveWell), the eating behavior and nutrition of a minority of restaurant patrons could improve (i.e., restaurant patrons who use nutrition information to guide their choices AND who use the programs' websites and/or apps). However, no empirical studies were found

which support this conclusion. Therefore, ***we cannot recommend the practice of joining the Healthy Dining or Kids LiveWell programs, on its own, as an effective means of improving nutrition or eating behaviors; however, we recommend examining the effectiveness of this practice in combination with other practices.***



Strategy 3 (Make Healthier Options the Default Choice): Practice

1. Make healthier options the default choice.

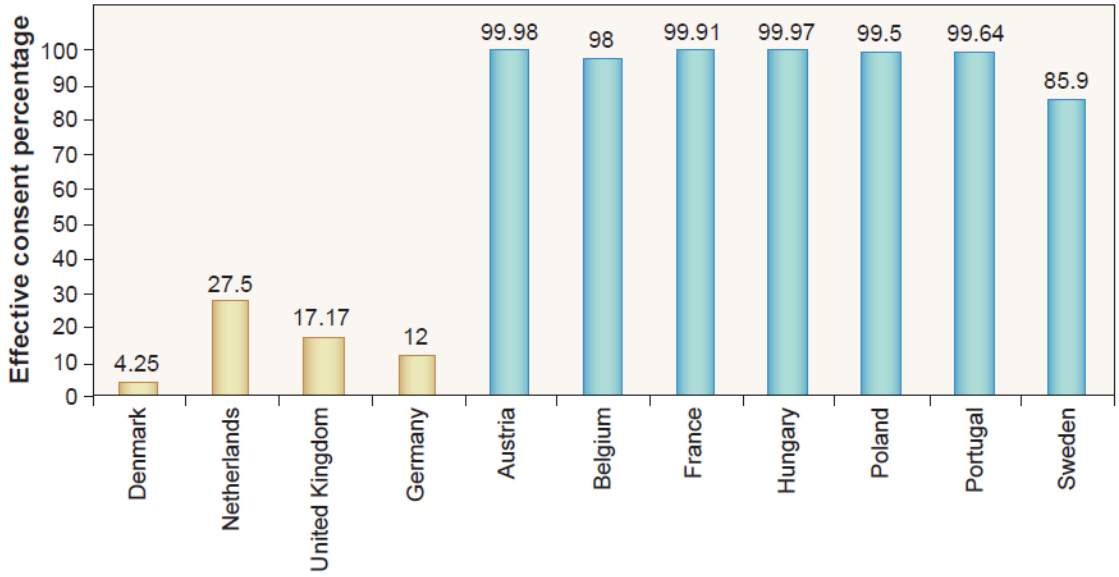
PRACTICE 1: MAKE HEALTHIER OPTIONS THE DEFAULT CHOICE

The patrons of foodservice venues come face-to-face with default choices each time they choose food. Most of the time, the default choice is not the healthier choice. For example, the default Starbucks latte is Grande-sized (16 oz) rather than Tall- (12 oz) or Short-sized (8 oz) and is made with 2% milk instead of nonfat milk (Starbucks Corporation, 2012a). At McDonald's, the default Extra Value Meals come with a medium soft drink (21 fl oz) and medium World Famous Fries (4.1 oz) instead of lower-calorie options such as a small soft drink (16 fl oz) and small World Famous Fries (2.5 oz) or other healthier options such as Apple Slices, a Side Salad, Fruit & Walnuts, water, low-fat milk, and juice (McDonald's, 2012a). Yet, some foodservice venues are beginning to make the default choices for children healthier.

Practice 1 Evidence. There is substantial evidence that changing default options impacts choice. For example, researchers have found that default options lead to increased participation in retirement savings plans (Madrian & Shea, 2001), increased purchase of optional features in vehicles (Park, Jun, & MacInnis, 2000), and increased subscription to email lists (Johnson, Bellman, & Lohse, 2002). An

example about the impact of default options from the health field is from a report entitled *Do Defaults Save Lives?* (Johnson & Goldstein, 2003). The authors, two Columbia University researchers from the Center for Decision Sciences, compared organ donation across eleven nations and found it differed considerably depending on whether or not organ donation was the default choice (i.e., whether individuals needed to opt in or opt out of organ donation) (Figure 17).

Figure 17. The percent of the population that are organ donors in 11 countries.



Effective consent rates, by country. Explicit consent (opt-in, gold) and presumed consent (opt-out, blue).

In both cases, the public may freely exercise personal choice, and yet the difference in numbers is striking. The authors provide the following potential reasons for the results:

- Individuals required to make a decision may interpret defaults as suggestions;
- It takes effort to opt into or out of a decision and no effort to accept a default choice; and
- Being confronted with the decision to change from a default choice can lead to loss aversion, a psychological phenomenon where the loss in a trade-off is perceived more negatively by an individual than what is gained.

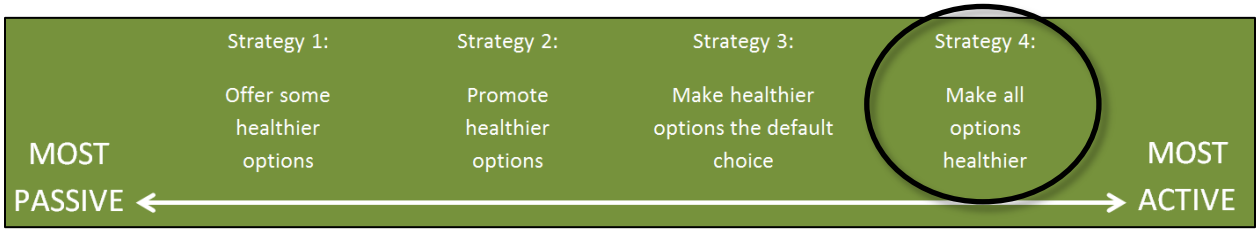
In terms of food choice, we found one research study that showed default choices influence food choice (Downs, Loewenstein, & Wisdom, 2009). In this study, adult patrons of a quick-service sandwich restaurant were told they would receive a free meal for completing a survey. Participating patrons were given one of two menu variations. Both menu variations featured five meals on a single page (i.e., the default choices) with a statement indicating that additional choices (i.e., the non-default choices) were

available in a separate pamphlet. The five featured meals differed on the two menu variations; one featured the five meals with the highest number of calories offered by the restaurant, while the other featured the five meals with the lowest number of calories. Patrons given the menu with the default low-calorie options were 48% *more* likely to choose a low-calorie meal and patrons given the menu with the default high-calorie options were 47% *less* likely to choose a low-calorie meal. That is, regardless of which menu was given (i.e., their default menu), the patrons were inclined to order off that menu and not ask for the alternative menu of choices.

Practice 1 Examples. A growing number of quick-service venues are making the default children's meal a healthier meal. The Burger King website, for example, shows a default BK® Kids Meal with the entrée (e.g., hamburger), a small side of Apple Slices, and a small drink of your choice (Burger King Corporation, 2012a). However, there appears to be some disconnect between corporate-level decisions and local practices related to default options. When we called ten Burger King stores across the nation (i.e., in Eldersburg, MD; James Island, SC; West Monroe, LA; Roswell, NM; State College, PA; Warwick, RI: Ocala, FL: Framington, MA; Rockland, ME; and Portland, OR) to ask what comes in a Hamburger BK® Kids Meal, every single store gave the same answer: a hamburger, fries, drink, and a toy. No apples. Only one store, the Framington, MA store, notified us that apples were an option. If healthier default choices are going to be effective at a population level, they need to be consistently implemented.

Practice 1 Summary. Default choices are present throughout the foodservice industry; however, they are rarely the healthiest choices and, when they are the healthiest choices, they are not always presented consistently across all the locations of a given foodservice company. Existing evidence suggests that default options influence what people choose, with the majority selecting the default option. In addition, the results from one empirical research study indicate that making healthy food options the default improves consumer food choice at quick-service restaurants. Therefore, if the default options at foodservice venues were healthier choices (i.e., if one had to opt-out of healthier choices), the positive impact on consumer health could be considerable. ***We recommend making healthier options the default choice at foodservice venues.***

Strategy 4: Make All Options Healthier



Strategy 4 (Make All Options Healthier): Practices

1. Collaborating with nutrition experts,

2. Implementing across-the-board stealth changes, and

3. Using organic produce and pasture-raised animal products.

PRACTICE 1: COLLABORATING WITH NUTRITION EXPERTS

A strategy, employed by few foodservice venues, is to make *all* options available to their patrons healthier. The first practice used to accomplish this strategy is to collaborate with registered dietitians and other nutrition experts.

Practice 1 Evidence. While we were able to find examples of foodservice venues employing nutrition experts to improve the healthiness of their menu, we were unable to locate any empirical evidence demonstrating the effect of employing nutrition experts within foodservice venues on consumer nutrition or eating behaviors. Further, we remind the reader of the distinction between rendering a menu *healthier* and having a *healthy* menu. For example, the Burger King website states

> "We have created a nutrition advisory panel consisting of outside experts in nutrition and health" (Burger King Corporation, 2012c),

and this nutrition advisory panel has helped Burger King make several changes to make their offerings *healthier* (e.g., reducing sodium); however, not all of the offerings on the Burger King menu are *healthy.* For example, the WHOPPER® line of sandwiches (i.e., without fries or a drink) has an average of 828 calories with as much as 82 grams of fat (in the TRIPLE WHOPPER® Sandwich with Cheese) (Burger King Corporation, 2012b). This is a very large number of calories to have in just a sandwich and approaches

or exceeds the amount of fat most adults should consume in an entire day (calorie and fat nutritional goals differ by age, gender, and activity level; see Appendices 1, 2 and 3).

Practice 1 Examples. We found several examples of quick-service venues that employ nutrition experts to help them develop healthier menus. Some quick-service restaurant chains, such as Burger King and Au Bon Pain, employ multiple nutrition experts within nutrition advisory boards. Au Bon Bain has had a nutrition advisory board since 2000 that is currently made up of four experts, including the Director of the Nutrition and Weight Management Center at Boston Medical Center, the Medical Director of the Obesity Consult Center at Tufts University School of Medicine, the Director of the Emory Prevention Research Center at University of Pennsylvania, and a registered dietician (ABP Corporation, 2012b). Burger King's nutrition advisory board was created in 2008 and is made up of the Director of Sports Nutrition for The Pennsylvania State University's Athletic Department, the Physician-in-Chief and Chair of the Department of Pediatrics at the Massachusetts General Hospital, the CEO of the Bayou La Batre Rural Health Clinic in Alabama, the Section Head of Nutrition Services for East Carolina University's medical school, and a registered dietician (Burger King Corporation, n.d.).

Based on advice from their nutrition advisory board, in 2003, Au Bon Pain began phasing out *trans* fats so that later, when the media began to focus their attention on the dangers of *trans* fats, over 80% of their menu offerings were *trans* fat-free (ABP Corporation, 2012b). Burger King similarly started phasing out *trans* fats in 2007 when they identified *trans* fat-free cooking oils, and they have reduced sodium levels in some of their popular menu items (e.g., the Tendergrill ® chicken sandwich and Chicken Tenders ®) (Burger King Corporation, n.d.).

In our exploration, we also found examples of caterers and vending companies following the advice of nutrition experts to make all of their offerings healthier. For example, we located a caterer that only prepares foods with < 600 calories, < 30% of calories from fat, no *trans* fat, ≤ 3 grams of saturated fat < 100 milligrams of cholesterol, < 1,000 milligrams of sodium, and ≥ 3 grams of fiber per serving (Guest Services Inc., 2012). We also identified a vending machine company selling foods and beverages free of partially hydrogenated oils (i.e. *trans* fats), high fructose corn syrup, and MSG (HUMAN Healthy Vending LLC, 2012).

Practice 1 Summary. We were able to find examples of a variety of foodservice venues that collaborate with nutrition experts to make all of their offerings healthier, but caution the reader that *healthier* offerings are not always *healthy.* We did not find any evidence of the effectiveness of

foodservice collaborations with nutrition experts on patron nutrition and eating behaviors. This practice has the potential to have a positive impact on patron health if the nutrition experts working with foodservice companies influence those companies to adopt meaningful across-the-board nutritional changes to their menus. At this time, ***we cannot recommend the practice of collaborating with nutrition experts, on its own, as an effective means of improving nutrition or eating behaviors; however, we recommend examining the effectiveness of this practice in combination with other practices.***

PRACTICE 2: IMPLEMENTING ACROSS-THE-BOARD STEALTH CHANGES

Stealth changes are those implemented gradually over a period of time so that consumers do not notice them. For example, foodservice venues may make a plan to reduce levels of sodium or *trans* fat over a period of 10 years.

Practice 2 Evidence. In our extensive search of the empirical literature, we were not able to find any research studies demonstrating the effectiveness of implementing stealth changes on patrons' nutrition or eating behaviors. Nevertheless, some nutrition experts are optimistic about the practice for two reasons (Aubrey, 2012). First, stealth changes are such gradual shifts that restaurant patrons do not realize they are buying anything different. That is, they are consuming healthier foods without knowingly changing their eating habits. Second, research findings indicate that the average overweight child only consumes between 110-165 extra calories each day (Wang, Gortmaker, Sobol, & Kuntz, 2006). Thus, the savings in calories provided by stealth changes (i.e., reducing the caloric content of foods) could contribute meaningfully toward reducing extra daily calories and the prevalence of childhood overweight. Moreover, stealth changes have the potential to make a significant change on consumer nutrition because meals eaten away from home, including meals from foodservice venues, contribute substantially to the American diet (i.e., 33% of the calories consumed by U.S. households in 2003-2006) and result in the consumption of more calories per eating occasion (i.e., an estimated 134 more calories for adults, 108 more calories for teenagers, and 65 more calories for all 6- to 18-year-olds), more total and saturated fat, and more cholesterol (Morrison, Mancino, & Variyam, 2011) than meals eaten at home.

Some experts speculate that we are beginning to see the effects of stealth changes that reduced *trans* fats in foods nationwide. For instance, a recent study (Kit et al., 2012) found that serum lipid concentrations (i.e., total cholesterol, high-density lipoprotein or HDL cholesterol, low-density lipoprotein or LDL cholesterol, non-high-density lipoprotein or non-HDL cholesterol, and triglycerides) in U.S. youth improved between 1988 and 2010 in all demographic groups investigated (e.g., different sexes, ages, and race/ethnic groups) despite an increase in the prevalence of obesity over the same period.

Nevertheless, while stealth changes result in *healthier* menus, these changes do not necessarily result in *healthy* menus. For example, the stealth change that is in place to reduce the caloric content of all food offerings at Olive Garden by 10% by 2016 is a good move, but even after a 10% reduction in calories their "Spaghetti & Italian Sausage" will still have 1143 calories (Darden Concepts Inc, 2012a). This is a large number of calories for a single meal, and represents about half the number of calories that most adults need in an entire day (calorie goals differ by age, gender, and activity level; see Appendices 1 and 2).

Practice 2 Examples. McDonald's has recently been publicized as pledging to make stealth changes to its menu that will result in lowering the sodium and sugar in their foods by 10%. According to Cindy Goody, the McDonald's Senior Director of Nutrition:

> "by 2020, we have made a commitment to reduce not only added sugars but saturated fat and calories across our national menu" (Aubrey, 2012).

The Darden family of restaurant brands (i.e., Red Lobster, Olive Garden, LongHorn Steakhouse, The Capital Grille, Bahama Breeze, Seasons 52, and Eddie V's) has made a similar commitment (Figure 18). After working with the Partnership for a Healthier America, they pledged to slash calories and sodium by 10% by 2016 and by 20% by 2021 (Darden Concepts Inc, 2012b). As mentioned previously, the quick-service restaurant Au Bon Pain implemented stealth changes to remove *trans* fats from their foods beginning in 2003. Several other foodservice venues have also worked to reduce or eliminate *trans* fats in their offerings.

Figure 18. Stealth changes planned at Darden restaurants.

Practice 2 Summary. A growing number of foodservice venues are implementing stealth changes to improve the nutritional value of their offerings over time. However, as noted several times in this report, caution is warranted in that *healthier* offerings are not always *healthy*. No evidence currently exists linking stealth improvements to foods eaten at foodservice venues with improved patron health. Nevertheless, improving the nutrition of foods eaten away from the home is a critical component to address. These foods comprise a significant portion of the typical American diet, and some emerging population-level health trends may demonstrate that this practice is beginning to yield public health benefits. At this time, ***we cannot recommend the practice of implementing stealth changes, on its own, as an effective means of improving nutrition or eating behaviors; however, we recommend examining the effectiveness of this practice in combination with other practices.***

PRACTICE 3: USING ORGANIC PRODUCE AND PASTURE-RAISED ANIMAL PRODUCTS

According to the National Restaurant Association's annual survey of American chefs, the use of locally sourced meats and seafood and the use of locally grown produce were identified by American chefs as top restaurant trends for 2012 (National Restaurant Association, n.d.). Many of these locally sourced ingredients are favored because they are organic and the animals are pasture-raised. From a nutritional perspective, organic produce is gaining in popularity for two main reasons. First, organic produce is touted as having a better nutrient composition than conventionally raised produce. Second, it is grown without chemical pesticides. Further, pasture-raised (e.g., grass-fed) animal products are generally cited as having better nutrient composition.

Practice 3 Evidence. There is little evidence with respect to the superior nutrient composition of organically raised produce. The existing evidence was recently summarized by researchers from Stanford University in a review of over 200 research articles examining the health of organic versus conventional foods. They concluded that strong evidence does not exist supporting that organic foods are more nutrient-dense. However, the researchers cited concerns with the strength of the studies and called for better-designed research (Smith-Spangler et al., 2012).

Substantial evidence exists supporting that more pesticides have been found on conventionally grown produce compared to organically grown produce. The same team of Stanford researchers concluded that the risk for contamination with pesticide residues was 30% lower for organically grown

produce and that urinary pesticide levels were significantly lower in children consuming organic diets (Smith-Spangler et al., 2012). These findings reinforce data from the United States Department of Agriculture's Pesticide Data Program which detected a wide variety of pesticides on commonly eaten fruits and vegetables in the United States (United States Department of Agriculture Pesticide Data Program, 2012). A substantial body of research has linked weight gain, increased body fat, and insulin resistance to pesticides, which have been found to accumulate in body fat and function as endocrine (i.e., hormone) disrupters. As a result, many pesticides are confirmed or suspected obesogens (i.e., obesity-causing agents) (Chadwick, Cooper, Chang, Rehnberg, & McElroy, 1988; Deichmann, MacDonald, & Cubit, 1975; Lind et al., 2012; Meggs & Brewer, 2007; Ruzzin et al., 2010; Slotkin, 2011; Villeneuve et al., 1977).

The Environmental Working Group, a team of external consumer advocate researchers, has assessed the results from the Pesticide Data Program and determined that the 12 most-contaminated fruits and vegetables, which it termed "The Dirty Dozen™," are apples, celery, sweet bell peppers, peaches, strawberries, imported nectarines, grapes, spinach, lettuce, cucumbers, domestic blueberries, and potatoes (Environmental Working Group, 2012). In addition, green beans and leafy greens (e.g., kale and collard greens), were identified as most likely to be contaminated with pesticides of special concern. Consuming organic varieties of these fruits and vegetables may be a good precaution to take to reduce obesogen exposure. In contrast, the "Clean 15™" fruits and vegetables were found to have the lowest amounts of pesticide residues. These were onions, sweet corn, pineapples, avocado, cabbage, sweet peas, asparagus, mangoes, eggplant, kiwi, domestic cantaloupe, sweet potatoes, grapefruit, watermelon, and mushrooms. Consuming conventionally raised varieties of these fruits and vegetables is less likely to raise one's exposure to obesogens.

There is evidence to support that pasture-raised animal products differ in nutrient composition from grain-fed animal products. Grain-fed beef is more fatty than grass-fed beef because conventionally raised beef cattle are fed grain in order to make their meat more fatty and palatable (Mandell, Buchanan-Smith, & Campbell, 1998). Further, the proportion of omega-3 and -6 fatty acids differ in grain-fed and grass-fed meat because omega-6 fatty acids are predominantly found in grains; whereas, omega-3 fatty acids are predominantly found in green plants (e.g., grass) (Simopoulos, 2008). Researchers at the University of California reviewed three decades of studies comparing the fatty acid profiles and antioxidant content of grass-fed and grain-fed beef. They concluded that grass-fed beef has less fat and cholesterol, a healthier fatty acid profile including more omega-3 fatty acids which leads to a

beneficial lower ratio of omega-6 to omega-3 fatty acids, and higher antioxidant (i.e., carotenoid and vitamin E) content (Daley, Abbott, Doyle, Nader, & Larson, 2010).

Practice 3 Examples. An increasing number of foodservice venues are serving foods with organic and pasture-raised ingredients. Relatively few of these restaurants are national chains. The quick-service venue Chipotle is at the forefront of the movement, serving "more naturally raised meat and local produce than any other restaurant company in the US" (Chipotle, n.d.). LYFE Kitchen, founded in part by a former Global President and COO for McDonald's, is joining the trend and serving local foods when seasonally possible, organic foods as available, and antibiotic- and hormone-free meats that are Global Animal Partnership-approved (LYFE Kitchen, 2012). We found examples of caterers that commit to using local organic produce when available (Harrison's, 2012) and vending machine companies that prioritize selling organic products (Sprout Healthy Vending, 2011). At its Mountain View campus, Google's Café 150 cafeteria has become well-known for its focus on organic foods sourced from within 150 miles of the venue (Food Management, 2006).

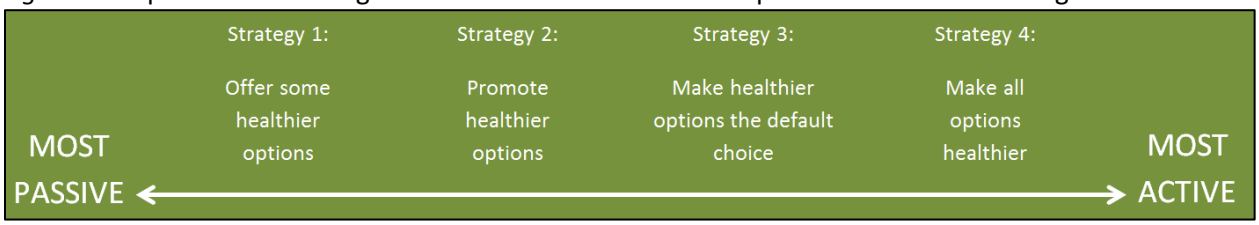
Practice 3 Summary. A growing number of foodservice venues are focusing on using organic and pasture-raised ingredients. Research findings do not provide strong evidence that organic produce has a better nutrient composition than conventionally grown produce. However, empirical evidence does exist supporting that organically grown foods have less pesticide residue and lower human exposure to pesticides. Because many pesticides are known or suspected obesogens, consuming organically grown varieties, rather than conventionally grown varieties, of fruits and vegetables is a simple precaution to reduce obesity risk. Further, there is evidence to support that pasture-raised animal products have a favorable nutrient composition compared to conventionally raised grain-fed animal products. Therefore, ***we recommend using organically grown varieties, rather than conventionally grown varieties, of fruits and vegetables, and pasture-raised animal products.***

Leading Public and Private Sector Organizations

In this report, **leading public and private sector organizations** will refer to schools and child-care facilities where serving food is not the primary function. We will focus on the strategies and practices being used at these locations to provide healthful foods and encourage healthy eating habits.

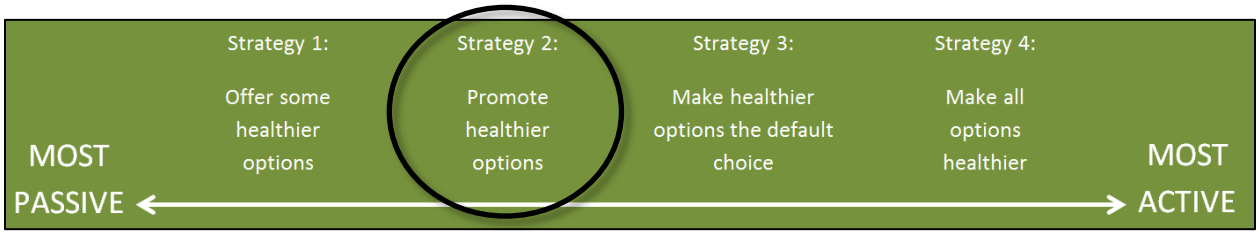
This school year, 49.8 million children attend public elementary (including pre-kindergarten) and secondary schools (National Center for Education Statistics, 2012), and 13 million children attend child-care facilities (Robert Wood Johnson Foundation, 2012). Children spend a significant portion of their awake time in schools and daycare centers, and during that time most children have at least one opportunity to eat (e.g., breakfast, lunch, and snacks). Children consume foods acquired through school foodservice programs, as well as from vending machines, school stores, snack bars, and by bringing food from home. The strategies schools and child-care facilities use to provide healthful food and encourage healthy eating habits fall on the passive to active spectrum referred to in the first section of this paper (Figure 3, repeated below).

Figure 3. A spectrum of strategies foodservice venues use to improve nutrition and eating behaviors.



We found evidence of two strategies from the above spectrum being utilized in schools and child-care facilities: promoting healthier options (i.e., Strategy 2) and making all options healthier (i.e., Strategy 4). We did not find evidence of schools and child-care facilities that used the strategies of simply offering healthier options (i.e., Strategy 1) or making healthier options the default choice (i.e., Strategy 3) to improve nutrition and eating behaviors.

Strategy 2: Promote Healthier Options



Strategy 2 (Promote Healthier Options): Practices

1. Increasing the accessibility and desirability of free drinking water;

2. Increasing the visibility, accessibility, and desirability of healthier foods; and

3. Implementing nutrition-related school-based programs that promote healthy eating.

PRACTICE 1: INCREASING THE ACCESSIBILITY AND DESIRABILITY OF FREE DRINKING WATER

Research has implicated sweetened beverages as a contributor toward obesity (Malik, Schulze, & Hu, 2006). In contrast, their displacement with water has been shown to decrease the intake of excess calories (Stookey, Constant, Gardner, & Popkins, 2007). While school and governmental policies have worked to reduce the availability of sweetened beverages in schools, separate initiatives have attempted to make drinking water more accessible and more desirable to consume.

Practice 1 Evidence. Making drinking water more accessible and desirable has been shown to increase the amount of water consumed as well as decrease the risk of obesity. One study found that the amount of water adults consume is significantly greater when (1) it is easy to obtain during a meal (i.e., at the table) as opposed to more difficult to obtain (i.e., 20 feet away) and (2) social modeling (i.e., when other adults sitting at the table are consuming the water on the table) is used (Engell, Kramer, Malafi, Salomon, & Lesher, 1996). A second study was conducted in elementary schools to determine the effects of providing water bottles and cold, filtered water via water fountains and promoting water consumption through a series of in-class lessons (Muckelbauer et al., 2009). The investigators found that the intervention increased water consumption and reduced the risk of childhood overweight by 31%.

Practice 1 Examples. The Healthy, Hunger-Free Kids Act of 2010 (HHFKA) mandates a series of improvements to food and beverage offerings provided through the USDA's Food and Nutrition Service programs, such as the National School Lunch Program (NSLP), which provides school lunches, and the Child and Adult Care Food Program (CACFP), which provides foods to children in child-care facilities and some after-school care programs. The HHFKA requires schools participating in the NSLP and facilities participating in the CACFP to make drinking water available at no cost during meal times (Food and Nutrition Service, n.d.). Some institutions are improving upon the HHFKA's provision to make water available by increasing the accessibility and desirability of drinking water. For example, elementary school students in Ceres, CA, have access to chilled filtered water from water stations their school district leases for $26 per month (Water in Schools, n.d.) (Figure 19). The "Rethink the Drink" campaign in Santa Barbara, CA, and the "Healthy When WET" initiative in Hingham, MA, provided schools with hydration stations where water bottles can be filled with cold filtered water, and students and staff were given reusable water bottles to use at the stations (Healthy When WET, n.d.; King, 2011). Similar hydration stations have been installed at Moore MST Magnet School in Tyler, TX (Jackson, 2012), Lichtfield High School in Lichtfield, MN (Berg, 2012), and other schools across the U.S.

Figure 19. An elementary school student from Ceres, CA, accesses drinking water at a water station her school district leases.

Practice 1 Summary. Providing and promoting the consumption of free drinking water is an effective means of reducing the risk of childhood overweight. Measures that increase access to water at mealtimes may increase water consumption. In addition, more students may be influenced to consume water in response to social modeling, so interventions should target entire school populations. ***We recommend the practice of increasing the accessibility and desirability of free drinking water.***

PRACTICE 2: INCREASING THE VISIBILITY, ACCESSIBILITY, AND DESIRABILITY OF HEALTHIER FOODS

The practice of increasing the visibility, accessibility, and desirability of healthier foods is emerging as a simple and low-cost way that schools can improve student nutrition and eating behaviors. Researchers from Cornell University's Food & Brand Lab are at the forefront of what they call the

Smarter Lunchrooms Movement, which equips school lunchrooms with evidence-informed tools to improve child eating behaviors and, thus, improve the health of children.

Practice 2 Evidence. *Selecting* healthier foods is a necessary first step toward eating healthy, but it does not ensure that these healthier foods are *being eaten*. Thus, in our examination of the effectiveness of increasing the visibility, accessibility, and desirability of healthier foods, we examined the research literature for evidence of students actually consuming healthier foods. We located a few studies indicating the effectiveness of increasing the visibility, accessibility, and desirability of healthier foods on students' eating behaviors. For example, creating a convenience line of healthier food options significantly increased students' consumption of healthier foods from 33% to 37% and significantly decreased students' consumption of less healthy foods from 28% to 23% of total grams of food consumed (Hanks et al., 2012). A second study found that prompting students to take a piece of fruit or 100% juice with their lunch significantly increased their likelihood of consuming fruit or juice (Schwartz, 2007). A third study demonstrated that naming vegetables creatively (e.g., "X-ray Vision Carrots") resulted in more students selecting and consuming the creatively named vegetable (Wansink et al., 2012).

Practice 2 Examples. In 2010, researchers from Cornell University's Food & Brand Lab launched the Smarter Lunchrooms Movement, which applies marketing-type practices in school cafeterias to "nudge" students into selecting more nutritious choices (Cornell University, 2012). The practices are simple and low-cost. Many practices involve promoting healthier options by increasing their visibility, accessibility, or desirability. For example:

- To increase the number of students selecting fruit, display whole fruit in attractive bowls;
- To increase the number of students selecting vegetables, give them creative names;
- To increase the number of students selecting non-flavored milk, place it in front of chocolate milk in the cooler;
- To increase the number of students selecting a targeted (e.g., healthier) entrée, make it the most prominent; and
- To increase the number of students selecting NSLP meals, create a convenience line so that these meals are easier and quicker to obtain than competitive foods.

Smarter Lunchrooms Movement practices have been implemented in schools throughout the United States. Many of the practices in this movement have been evaluated in terms of effectiveness; however, the program still needs to be assessed.

Practice 2 Summary. Implementing the simple and low-cost techniques (e.g., using marketing techniques to "nudge" students into making healthier choices) within a cafeteria is likely to improve student nutrition. While not all of the practices outlined by the developers of the Smarter Lunchrooms Movement have been evaluated in peer-reviewed publications, many of those practices that have been evaluated show promise. ***We recommend using the practice of making healthier foods more visible, accessible, and desirable, as outlined by the Smarter Lunchrooms Movement.***

PRACTICE 3: IMPLEMENTING NUTRITION-RELATED SCHOOL-BASED PROGRAMS THAT PROMOTE HEALTHY EATING

Schools are a convenient place to implement nutrition-related programs because many children can be targeted at once. As a result, several school-based nutrition programs have been developed. For a directory of such programs, the reader is advised to visit the Clearinghouse for Military Readiness website at www.militaryfamilies.psu.edu and use the Advanced Search function under the PROGRAMS tab to select school-based obesity programs. While a large number of obesity prevention programs have been designed for school-based delivery, we will only highlight a few programs that demonstrate evidence of effectiveness.

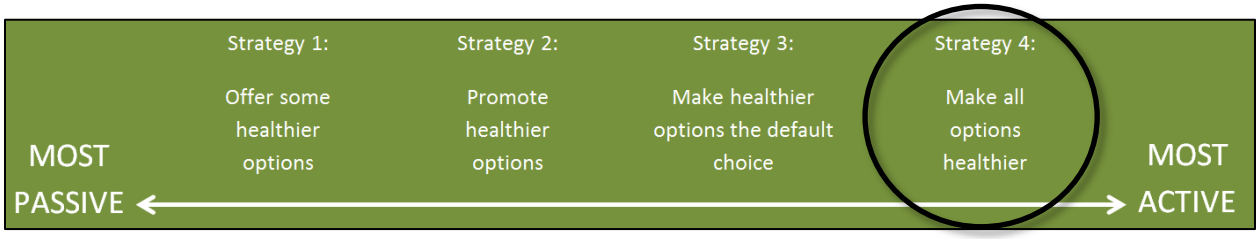
Practice 3 Evidence and Examples. Gimme 5-Atlanta (see Appendix IV) was designed to promote fruit and vegetable consumption in 4th and 5th grade students. The program is classroom-based, and focuses on: (1) developing students' ability to ask for fruits, juices, and vegetables at home and in restaurants; (2) increasing students' preference for fruits, juices and vegetables; (3) training students to prepare fruits, juices, and vegetables for meals and snacks; and (4) developing student goal-setting skills and enhancing student problem-solving skills for occasions when goals are not met. Lessons include activities such as role-playing and preparing and sampling foods (Clearinghouse for Military Family Readiness, 2012c). Compared to students at the control schools (i.e., schools where program was not implemented), students attending schools that implemented the program (1) consumed more total fruit, juice, and vegetable servings per day; (2) reported more asking behaviors

(i.e., requests to family members for increased fruit, juice, and/or vegetable availability or accessibility); and (3) had more knowledge about fruits, juices, and vegetables with respect to serving recommendations, setting goals for consumption, and strategies for including more servings in the diet (Baranowski et al., 2000; Domel et al., 1993).

Another program, the 5-A-Day Power Plus program, for 4th and 5th grade students (see Appendix IV), involves improving the variety and attractiveness of fruit and vegetable choices at school lunch, engaging students in competitions to increase their fruit and vegetable consumption, and using point-of-sale fruit and vegetable promotions that make use of curricular messages taught in the classroom (Clearinghouse for Military Family Readiness, 2012a). A randomized controlled trial of 20 schools revealed that students participating in the program significantly increased their fruit and vegetable consumption during school lunches (Perry et al., 1998).

Practice 3 Summary. School-based programs promoting healthy food choices demonstrate strategies that can be effective in improving student nutrition and eating behaviors. Not all programs show evidence of effectiveness; therefore, we advise the reader to visit the Clearinghouse for Military Family Readiness website for a directory of school-based, obesity-prevention programs and information about the effectiveness of specific programs. ***We recommend the use of nutrition-related, school-based programs that promote healthy eating, and we recommend using the United States Department of Agricultural Food and Nutrition Science website and the Clearinghouse for Military Family Readiness for guidance in selecting programs.***

Strategy 4: Making All Options Healthier



Strategy (Making All Options Healthier): Practices

1. Implementing the mandated changes to the National School Lunch and School Breakfast Programs,

2. Regulating competitive foods,

3. Implementing the improved nutrition standards for CDCs,

4. Serving local and organic foods, and

5. Implementing nutrition-related, school-based programs that make all foods healthier.

PRACTICE 1: IMPLEMENTING THE MANDATED CHANGES TO THE NATIONAL SCHOOL LUNCH AND SCHOOL BREAKFAST PROGRAMS

The NSLP and SBP are long-standing child nutrition programs overseen by the United States Department of Agriculture (USDA). At their foundation, a primary function of the programs was to protect the health of school children in the United States. The programs have a wide reach, with an estimated 83% of all schools (i.e., public and private) participating in the NSLP and 60% of children in those participating schools eating the school lunch (i.e., more than 31 million children per day). For the SBP, 85% of public schools participate and 24% of children in those participating schools eat the school breakfast (i.e., more than 10 million children per day) (Food and Nutrition Service, 2012a).

In 2010, the Institute of Medicine (IOM) recommended a series of improvements that would re-align the NSLP and SBP with the current health needs of the nation's children (Institute of Medicine, 2010). These recommendations helped to shape the HHFKA, which began to go into effect in July 2012 (Food and Nutrition Service, 2012c) and will continue to be gradually phased in. Below is a summary of the revised NSLP and SBP (Food and Nutrition Service, 2012b):

- Age groups around which menu planning will happen are now narrower to better meet the nutrient and calorie needs of all children;
- Calorie ranges (i.e., minimum and maximum levels) are now given in place of only calorie minimums. NSLP calorie ranges are to be implemented now and SBP calorie ranges will be implemented in the 2013-2014 school year. The ranges are:
  - For K-5th grade, 350-500 daily breakfast and 550-640 daily lunch calories;
  - For 6th-8th grade, 400-500 daily breakfast and 600-700 daily lunch calories; and
  - For 9th-12th grade, 450-600 daily breakfast and 750-850 daily lunch calories;
- Lower sodium levels are being gradually phased in by the 2022-2023 school year. The final levels are:

  - For K-5th grade, ≤ 430 daily breakfast and ≤ 640 daily lunch milligrams;
  - For 6th-8th grade, ≤ 470 daily breakfast and ≤ 710 daily lunch milligrams; and
  - For 9th-12th grade, ≤ 500 daily breakfast and ≤ 740 daily lunch milligrams;
- Saturated fat will remain as less than 10% of total calories but *trans* fat (artificial only) must be 0 grams per serving this year in the NSLP and by the 2013-2014 school year for the SBP;
- Students must take between three and five lunch offerings (i.e., from the fruit, vegetable, grain, meat/meat alternative, and milk components), and at least one of these must be ≥ ½ cup of fruit or vegetable. Lunch offerings must include:
  - One daily serving of fruit, less than half of which may be 100% juice;
  - One daily serving of vegetables that includes a variety of dark green (e.g., broccoli), red/orange (e.g., sweet potatoes), legumes (e.g., lentils), starchy (e.g., corn), and other (e.g., onions) over the course of each week;
  - Grain offerings within a weekly range of servings (i.e., 8-9 oz equivalents for K-5th grade, 8-10 oz equivalents for 6th-8th grade, and 10-12 oz equivalents for 9th-12th grade), at least half of which must be whole grain-rich (i.e., ≥ 50% whole grains) now and all of which must be whole grain-rich by the 2014-2015 school year, and less than two of which may be grain-based desserts each week;
  - Meat/Meat Alternative offerings within a weekly range of servings (i.e., 8-10 oz equivalents for K-5th grade, 9-10 oz equivalents for 6th-8th grade, and 10-12 oz equivalents for 9th-12th grade); and
  - One daily serving of milk, which may include fat-free flavored and non-flavored milk, low-fat white milk, or fat-free and low-fat lactose-reduced or –free milk only; and
- Students must take between three and four breakfast offerings (i.e., from the fruit and vegetable, grain, and milk components, plus an additional item), and at least one of these must be ≥ ½ cup of fruit or vegetable. Breakfast offerings must include:
  - One daily serving of fruit or vegetables;
  - Grain offerings within a weekly range of servings (i.e., 7-10 oz equivalents for K-5th grade, 8-10 oz equivalents for 6th-8th grade, and 9-10 oz equivalents for 9th-12th grade) , at least half of which must be whole grain-rich (i.e., ≥ 50% whole grains) now and all of which must be whole grain-rich by the 2014-2015 school year;
  - Meat/Meat Alternative offerings may be given in place of grains if the weekly grains minimum has been met;

- One daily serving of milk, which may include fat-free flavored and non-flavored milk, low-fat white milk, or fat-free and low-fat lactose-reduced or –free milk only.

Practice 1 Evidence. The NSLP and SBP changes largely follow evidence-based recommendations made by the IOM and reflect the evidence-based 2005 Dietary Guidelines for Americans.

Practice 1 Summary. Changes to the NSLP and SBP mandated by the HHFKA follow recommendations from the IOM based on current scientific evidence and re-align school foods with the Dietary Guidelines for Americans. In particular, the implementation of maximum calorie levels, sodium and *trans* fat reductions, and increased fruit, vegetable, and whole grain requirements will translate into meaningful nutrition improvements for the population of children participating in the NSLP and SBP. ***While these changes to the National School Lunch and School Breakfast Programs are mandatory, we highly recommend compliance with changes in both practice and attitude.***

PRACTICE 2: REGULATING COMPETITIVE FOODS

Competitive foods are sold in schools outside of the federal school foodservice programs (i.e., National School Lunch and School Breakfast Programs). They include foods and beverages sold by on-site vendors (e.g., student stores) and in vending machines, a la carte offerings sold by school foodservices, and foods sold at fundraisers. The standards for foods sold outside of the federal meal programs are outdated as they have not been updated since 1979. The HHFKA gives the USDA the authority to regulate nutritional standards for all foods served throughout the school day and on the school campus. Currently, competitive foods do not need to be healthy, and this creates concern for several reasons:

- Competitive foods can have a low nutrient density but a lot of fat, sugar, and calories, and foods with these properties are not good for children's health;
- Competitive foods can be purchased in place of, or in addition to, school meals, which can result in low nutrient intake and/or overconsumption;
- Competitive foods can stigmatize participation in the NSLP or SBP, which are more nutritionally balanced and available to all youth regardless of financial status;
- Competitive foods may make school meal programs less viable if there is a decrease in student participation; and

- Competitive foods send a mixed message when students learn about healthy eating in their classrooms and find unhealthy foods for sale within the school (Center for Science in the Public Interest, 2001).

Findings from a study on the availability and consumption of competitive foods suggested that: (1) competitive foods were widely available, (2) 40% of children consumed at least one competitive food per school day, and (3) the most frequently consumed competitive foods were low in nutrient density and high in energy density which is linked to poor nutrition and an increased likelihood for obesity (Fox, Gordon, Nogales, & Wilson, 2009).

In 2007, the Institute of Medicine issued policy recommendations for competitive foods (2007). Currently, the USDA is translating these recommendations into proposed nutrition standards for competitive foods. In the meantime, many state and local governments have begun to enforce their own regulations; however, the robustness of these policies varies. In fact, a recent study found that less than 5% of school district policies meet the 2010 Dietary Guidelines for Americans (Schneider, Schermbeck, Chriqui, & Chaloupka, 2012).

Practice 2 Evidence. Making all foods in school healthier by enforcing competitive food laws appears to be an effective way to improve student nutrition. Findings from a recent study suggest that policy regulating the nutrition content of competitive foods in schools reduces BMI change (i.e., promotes a healthier weight) in adolescents when that policy is comprehensive, contains strong language (i.e., has measureable standards rather than ambiguous standards, and has standards that are required as opposed to recommended), and targets multiple grade levels (Taber, Chriqui, Perna, Powell, & Chaloupka, 2012).

Practice 2 Summary*.** Although school meals are healthy and are linked to best practices, competitive food availability poses a major challenge to improving students' healthy food intake. Until the USDA's competitive food regulations are finalized, local and state competitive food laws can be an effective means of improving student nutrition when they are comprehensive, have measureable standards that are required rather than recommended, and target multiple grade levels. ***We recommend the development and enforcement of competitive food regulations that are comprehensive, contain strong language, and target multiple grade levels.

PRACTICE 3: IMPLEMENTING THE IMPROVED NUTRITION STANDARDS FOR CDCS

The DoD's Office of Family Policy, Children, and Youth has made recent improvements to the nutrition standards for meals and snacks served at all CDCs. This practice is still new; it was implemented in early 2012.

Practice 3 Evidence. The new CDC nutrition standards were developed to be in agreement with the Dietary Guidelines for Americans and recommendations issued by the American Academy of Pediatrics, the American Public Health Association, the National Resource Center for Health and Safety in Child Care and Early Education, and the *Let's Move!* Child Care campaign. Given that the standards adhere to evidence-informed recommendations from leading public health groups, these standards are likely to translate into meaningful nutrition improvements for the population of young children eating meals and snacks at CDCs. However, no evaluations of effectiveness have been conducted due to the short timeframe that these changes have been in place.

Practice 3 Summary. The DoD changes, related to the foods and beverages served to young children, stipulate that foods are healthy and adhere to evidence-informed dietary recommendations. ***We recommend continued implementation of the new CDC nutrition standards. Furthermore, we recommend conducting a robust evaluation of the effectiveness of these standards on children's health outcomes.***

PRACTICE 4: SERVING LOCAL AND ORGANIC FOODS.

Local and organic foods are served at public and private sector organizations through a variety of means. *Farm to School* and *Farm to Preschool* programs, gardening initiatives, and prioritizing the purchase of local and organic foods are ways to contribute to the provision of local and organic foods at these organizations.

Practice 4 Evidence. We did not locate evidence suggesting that providing local produce and agricultural products improves the nutrient intake of children more than providing any fresh produce and agricultural products. Currently, there are several research studies underway examining whether or not providing locally grown foods is effective in improving the nutrient intake of children. Nevertheless, as noted by the Dietary Guidelines for Americans, locally grown and produced foods help to comprise a

healthy diet (United States Department of Agriculture and United States Department of Health and Human Services, 2010).

With regard to organic produce, as described in the first section of this report consuming more fruits and vegetables, whether they are conventionally or organically grown, is recommended for improving and sustaining health by the Dietary Guidelines for Americans (United States Department of Agriculture and United States Department of Health and Human Services, 2010) (see Appendix I). Yet, there is growing concern and evidence that pesticide residues on conventionally grown fruits and vegetables may act as obesogens, whereas this concern is not relevant with organically grown produce.

School gardening efforts vary in size, production, and extent of their connection to classroom curricula. Nevertheless, there is evidence to suggest, albeit limited, that gardening programs may help to increase student preference for vegetables (Morris & Zidenberg-Cherr, 2002). More evaluative research is needed to determine whether school gardening results in improved nutrition.

Practice 4 Examples. *Farm to School* and *Farm to Preschool* initiatives are intended to connect schools and child-care facilities with their regional and local food systems so that local foods are served to children and youth. The HHFKA includes provisions to encourage these partnerships by providing $5,000,000 in grants each year, beginning October 1, 2012, to help schools build and strengthen their *Farm to School* programs. Schools that make local foods available on school menus and teach nutrition education lessons involving school gardening- or farm-based activities are given preference for the grant (Public Health Law Center, 2011). The HHFKA enables schools and child-care facilities to give preference to purchasing local and unprocessed produce and other agricultural products for use in meals provided through the NSLP, SBP, and CACFP (Daniel, 2011). Encouraging the purchase of organic foods in schools is another goal of the HHFKA. For instance, between 2011 and 2015, $10,000,000 in grants will be available to help public schools improve student nutrition by increasing the quantity of organic foods provided to school children (Food and Nutrition Service, n.d.; Public Health Law Center, 2011).

More schools and child-care facilities are growing on-site gardens. Some of these gardening initiatives are connected to *Farm to School* and *Farm to Preschool* programming. In other cases, schools and day cares form partnerships with community support networks such as land-grant universities and their Master Gardeners programs. Gardens provide children with the opportunity to learn first-hand where their food comes from and taste a variety of seasonal produce.

Practice 4 Summary. Fruits and vegetables are essential for a healthy diet. Currently, no strong empirical evidence exists supporting that locally-sourced or organically-grown produce is nutritionally superior to produce sourced elsewhere. However, there is evidence that organically-grown produce has less pesticide residue and lowers human exposure to pesticides. While there is no risk for obesity from eating produce that is pesticide-free, many pesticides are known or suspected obesogens. Thus, a suggested precaution is to promote the consumption of organically grown varieties, rather than conventionally grown varieties, of the fruits and vegetables that have the highest amounts of pesticide residue (i.e., apples, celery, sweet bell peppers, peaches, strawberries, imported nectarines, grapes, spinach, lettuce, cucumbers, domestic blueberries, potatoes, green beans and leafy greens). There is some evidence, albeit limited, that school gardening improves child eating behavior; however, the effect of school gardening on nutrition and obesity outcomes is an important area for future evaluative research initiatives. ***We recommend using organically grown varieties, rather than conventionally grown varieties, of fruits and vegetables, and we recommend examining the effectiveness of school gardening programs on child nutrition and eating behavior.***

Practice 5: Implementing nutrition-related school-based programs that make all foods healthier.

As described previously, school-based nutrition programs are plentiful because schools provide a location to deliver programming to many children at once. We have discussed the availability of nutrition-related programs that promote healthy foods. Programs also exist that work to improve all of the foods in schools. We will highlight two such programs here, both of which have evidence of effectiveness. Again, we direct the reader to visit the Clearinghouse for Military Readiness website to learn about other school-based obesity prevention programs.

Practice 5 Evidence and Examples. Coordinated Approach to Child Health (CATCH) (see Appendix IV) is a coordinated school-health program targeting children in Kindergarten through 8th grade. This program uses a combination of strategies. The nutrition component of the program occurs in the classroom and in the cafeteria. In the classroom, teachers use the program curriculum to provide information and lead children in skill-building activities that promote healthy eating. In the cafeteria, all foods are made healthier by lowering the total fat, saturated fat, and sodium content of breakfast and lunch foods. Children receive education to help make healthy food choices (Clearinghouse for Military Family Readiness, 2012b). The effectiveness of CATCH has not been evaluated in all of the grades it

targets; however, it has some effectiveness in 3rd and 5th grades. In one study, CATCH schools were successful in improving cafeteria food (i.e., reducing total calories and the percent of calories from fat and saturated fat) and students' health knowledge and behavior. Moreover, three years post-intervention, some of these changes were maintained (Luepker et al., 1996; Lytle et al., 1996; Nader et al., 1999; Webber et al., 1996). In a second study, CATCH participation in a predominantly low-income, Hispanic school setting resulted in marked reductions in the prevalence of overweight in boys and girls (Coleman et al., 2005).

The HEALTHY Intervention Program (see Appendix IV) is a school-based program for 6th to 8th grade students at high risk for type 2 diabetes and obesity. The nutrition-based component of the program involves improving the entire school-food environment (e.g., cafeteria, vending, and school fundraisers) to reduce fat, provide more fruits, vegetables, and whole grains, and serve only healthy beverages. In addition, the program involves classroom-based activities to support behavior modification and social marketing strategies (e.g., displaying program posters and giving students incentives like water bottles) to keep students motivated (Clearinghouse for Military Family Readiness, 2012d). Evidence from a randomized controlled trial involving 42 middle schools found that the intervention group, as a whole, experienced a slight reduction in weight status, the prevalence of high waist circumference values, and fasting insulin as compared to the control group. The high-risk portion of the intervention group also had a reduction in the rate of obesity as compared to the control group (Bachman, Singhal, Misra, & Foster, 2010).

Practice 5 Summary. School-based programs that improve all school foods can be an effective way to improve student nutrition and eating behaviors. These programs generally involve classroom-based and cafeteria-based components so that nutrition education can reinforce changes to the school-food environment. We advise the reader to visit the Clearinghouse for Military Family Readiness website for a directory of school-based, obesity-prevention programs and information about the effectiveness of specific programs. ***We recommend the use of nutrition-related school-based programs designed to make all foods healthier, and we recommend using the Clearinghouse for Military Family Readiness for guidance in selecting programs.***

Recommendations for Instilling Healthy Foodservice Practices

"Food is morale in the Military."
- SSG Guy Winks, Culinary Institute of America Military Liaison (Dodich, 2009)

Today, the DoD and Military Services confront unique challenges with limited resources. The obesity epidemic presents a vital and ongoing challenge as the Military strives to meet recruitment goals and provide cost-effective health care to soldiers, veterans, and their dependents. The DoD has assumed a lead role in addressing the obesity epidemic. The DoD Obesity Work Group has identified a range of opportunities for obesity prevention, including the food environment. The Military's infrastructure is conducive to employing holistic changes to its food environment. These changes initiated in the Military could create a cultural shift that impacts the obesity epidemic positively affecting the Military and the nation.

With the understanding that foodservice providers play a key role in transforming the food environment and promoting health, the DoD is creating and promoting a healthier food environment. The following recommendations are based on this review of the existing evidence of the strategies and practices currently utilized by the foodservice industry to improve patron nutrition and eating behaviors. The recommendations are designed to assist with the transformation of foodservices on Military installations; thereby contributing to a healthier food environment. As described in the statement of work for this tasker, the ensuing strategies and practices can be employed by the DoD to encourage healthier eating for Service Members, families, civilian employees, and retirees living on and off of the installations.

The first two sections of this report are organized by the strategies; however, after further review of the evidence we determined that some of the practices within each of the four strategies were effective, while others lacked empirical evidence. That is, none of the four strategies were found to be totally support by evidence of their effectiveness. Therefore, in this section, the recommendations we give are for individual practices rather than for strategies. Accordingly, our recommendations are organized into three categories: (1) recommended practices that are evidence-informed, (2) practices recommended only with an examination their effectiveness, and (3) practices recommended for use only in combination with other practices and examined for their effectiveness. We will also note where a recommendation applies to:

- foodservice venues (i.e., venues that exist for the purpose of serving food) including quick-service and casual-dining restaurants, clubs, cafeterias, snack bars, catering, and vending machines;
- public and private sector organizations (i.e., locations where serving food is not a primary function), including schools and child-care facilities; or
- both foodservice venues and public and private sector organizations.

Category 1. Recommended practices that are evidence-informed

Practices:	Recommended for use by:
Using organically grown varieties, rather than conventionally grown varieties, of fruits and vegetables, and pasture-raised animal products	Foodservice venues, Public and Private Sector Organizations
Complying with the changes to the National School Lunch and School Breakfast Programs in both practice and attitude	Public and Private Sector Organizations (specifically, schools and child-care facilities participating in these federal foodservice programs)
Continuing with the implementation of the new CDC nutrition standards	Public and Private Sector Organizations (specifically, CDCs)
Developing and enforcing competitive food regulations (i.e., policy that is comprehensive, contains strong language, and targets multiple ages)	Public and Private Sector Organizations (specifically, schools and child-care facilities participating in federal foodservice programs)
Using nutrition-related school-based programs designed to make all foods healthier or promote healthier foods	Public and Private Sector Organizations
Making healthier options the default choice	Foodservice Venues
Using the specific practices found to be effective in promoting healthier options at the point of sale in cafeteria settings	Foodservice Venues (specifically, cafeterias)
Increasing the accessibility and desirability of free drinking water	Public and Private Sector Organizations
Making healthier foods more visible, accessible, and desirable, as outlined by the Smarter Lunchrooms Movement	Public and Private Sector Organizations

Suggested Steps for Implementing Recommended Practices in Category 1.

To implement using organically grown varieties, rather than conventionally grown varieties, of fruits and vegetables, and pasture-raised animal products at foodservice venues and public and private sector organizations:

1. Conduct a feasibility study offering organic produce at all foodservice venues on each Military installation. Collaboration with local and regional food systems (potentially utilize the USDA's *Know Your Farmer, Know Your Food* initiative) and utilization of community gardening efforts are methods available for addressing this step.
2. Encourage public and private sector organizations to examine the feasibility of offering more organic produce.
3. Encourage schools: (a) to apply for HHFKA grant funding to increase organic foods; (b) to connect with local and regional food systems using the USDA's *Know Your Farmer, Know Your Food* initiative, National Farm To School Network, and/or Farm to Preschool program; and (c) to utilize community gardening efforts.
4. Focus on providing organically grown apples, celery, sweet bell peppers, peaches, strawberries, imported nectarines, grapes, spinach, lettuce, cucumbers, domestic blueberries, potatoes, green beans, and leafy greens (e.g., kale and collard greens); because conventionally grown varieties of these fruits and vegetables were found, through the USDA's Pesticide Data Program, to contain the most pesticide residues.
5. When organic produce is unavailable, foodservice venues and public and private sector organizations should be encouraged to continue to serve a wide variety of fruits and vegetables.
6. Where feasible, utilize pasture-raised meats rather than conventionally-raised meats; pasture-raised meats are naturally leaner (i.e., less fat and cholesterol) and contain more omega-3 fatty acids and antioxidants.

To implement complying with the changes to the National School Lunch and School Breakfast Programs in both practice and attitude at schools and child-care facilities participating in these federal foodservice programs:

1. To ensure a healthy diet for children and youth, schools participating in the NSLP and SBP should be encouraged to fully comply with HHFKA regulations.

To implement continuing with the implementation of the new CDC nutrition standards at CDCs:

1. CDCs should be encouraged and incentivized to adhere to their new nutrition standards.

To implement competitive food regulations at schools and child-care facilities participating in federal foodservice programs:

1. Consult with researchers to understand the guidance provided in the Taber et al. (2012) study as this is a model of the evidence base for increasing the nutrition of competitive foods.
2. Develop and enforce a policy around the nutrition standards of competitive foods in schools and childcare facilities that is comprehensive, contains strong language (i.e., has measurable standards rather than ambiguous standards, and has standards that are required as opposed to recommended), and targets multiple grade levels.

To implement nutrition-related school-based programs designed to make all foods healthier or promote healthier foods at public and private sector organizations:

1. To implement school-based nutrition programs with evidence of effectiveness, utilize the resources found at the USDA Food and Nutrition website, at the Clearinghouse for Military Family Readiness website, or contact members of the Resource Center for the Prevention of Military Child Obesity to learn about implementation of these programs.

To implement making healthier options the default choice at foodservice venues:

1. Require that contracted foodservice venues (e.g., quick-service and casual-dining restaurants and vending machine operators) make their default options the healthiest options available; foods with the lowest number of calories (i.e., lowest in energy density and/or the smallest portion size) with the highest nutrient density.
2. Employ a team of nutrition experts (e.g., registered dieticians, nutrition researchers, obesity researchers, and members of the medical community) to review the healthy default choices selected by contracted foodservice companies and counsel DoD-operated foodservice venues through their selection process.
3. Provide foodservice venues a one-year time period to comply with the new policy at 50% of Military installation venues. The consequence for not complying is loss of contract.

To implement using the specific practices found to be effective in promoting healthier options at the point of sale in cafeteria settings:

1. Employ a team of marketing and consumer behavior experts. These experts will help develop policies for cafeterias, and ensure that an effective means of promoting healthier options at the point of sale will be used.
2. Employ a team of nutrition experts (e.g., registered dieticians, nutrition researchers, obesity researchers, and members of the medical community) to review the choices selected for promotion by contracted foodservice companies and counsel DoD-operated foodservice venues through their selection process.
3. Provide foodservice venues a one-year time period to comply with the new policy at 50% percent of Military installation venues. The consequence for not complying is loss of contract.

To implement increasing the accessibility and desirability of free drinking water in public and private sector organizations:

1. Employ a team of marketing, advertising, and consumer behavior experts to design social marketing campaigns to increase awareness and promote free drinking water for the Military community.
2. Establish an initiative that focuses on increasing the accessibility (e.g., water fountains and water filling stations) to cool, filtered water.
3. Establish a CDC- and school-based education and awareness program that focuses on improving water accessibility (e.g., water fountains and water filling stations).
4. Pilot test new innovations to increase desirability of free drinking water.

To implement making healthier foods more visible, accessible, and desirable, as outlined by the Smarter Lunchrooms Movement in public and private sector organizations:

1. To promote the selection and consumption of healthier foods, utilize information from the Smarter Lunchrooms Movement website (Cornell University, 2012) that offers simple and low-cost methods of making healthier foods more attractive, conspicuous, and convenient. These include, but are not limited to:
    - moving fruit to more appealing and noticeable locations;
    - naming vegetables and displaying the new names with the foods; and

- placing white milk first in the lunchroom coolers, in front of flavored milks and other high-calorie drinks.

Category 2. Practices recommended ONLY with an examination of their effectiveness

Practices:	Recommended for use by:
School gardening programs	Public and Private Sector Organizations
Specific point-of-sale practices found to be effective in promoting healthier options at cafeteria settings as well as non-cafeteria locations on installations	Foodservice Venues (specifically, non-cafeteria settings)
Advertising campaigns designed to promote healthier consumer purchasing behavior	Foodservice Venues

Suggested Steps for Implementing Recommended Practices in Category 2.

To examine the effectiveness of school gardening programs on child nutrition and eating behaviors in public and private sector organizations:

1. Identify a school gardening program or programs that are educational; targeting children and their families, and school communities. These programs need to be supported by classroom lessons.
2. Employ a team of researchers in the field of nutrition and social sciences to design evaluations examining the effectiveness of a school gardening curriculum on child nutrition and eating behaviors within a Military school and/or childcare setting.

To examine the effectiveness of the specific point-of-sale practices found to be effective in promoting healthier options at cafeteria settings as well as in non-cafeteria foodservice venues on installations:

1. Identify the practices that have been shown to be effective in promoting healthier options at the point of sale in cafeterias.
2. Employ a team of researchers to design evaluations examining the effectiveness of these practices in non-cafeteria foodservice venues.
3. Once the planned evaluations have been completed and the effective practices have been identified for use in non-cafeteria foodservice venues, implement these selected practices.
4. Employ a team of marketing and consumer behavior experts. These experts will assist in the development of policies for the identified foodservice venues, and ensure that an effective means of promoting healthier options at the point of sale will be used.

5. Employ a team of nutrition experts (e.g., registered dieticians, nutrition researchers, obesity researchers, and members of the medical community) to review the choices selected for promotion by contracted foodservice companies and counsel DoD-operated foodservice venues through their selection process.
6. Provide foodservice venues a one-year time period to comply with the new policy at 50% percent of Military installation venues. The consequence for not complying is loss of contract.

To examine the effectiveness of advertising campaigns designed to promote healthier consumer purchasing behavior in foodservice venues:

1. Identify an existing advertising campaign used to influence healthier consumer purchasing behaviors in foodservice venues; or employ a team of marketing, advertising, and consumer behavior experts to design healthy food advertising campaigns for the Military community.
2. In the second year of the campaign, conduct an evaluation of the campaign to determine its effectiveness.
3. Utilize information from the evaluation to inform future marketing actions.

Category 3. Practices recommended ONLY if used in combination with other practices AND examined for their effectiveness

Practices:	Recommended for use by:
Collaborating with nutrition experts	Foodservice Venues
Implementing stealth changes	Foodservice Venues
Promoting healthier options outside of the point of sale	Foodservice Venues
Joining the Healthy Dining or Kids LiveWell programs	Foodservice Venues (specifically, quick-service and casual-dining restaurants)
Menu labeling	Foodservice Venues
Using technology to make food information available	Foodservice Venues

Suggested Steps for Implementing Recommended Practices in Category 3.

To examine the effectiveness combining some or all of the following practices including: (a) collaborating with nutrition experts; (b) implementing stealth changes; (c) promoting healthier options outside of the point of sale; (d) joining the Healthy Dining or Kids LiveWell programs; (e) menu labeling; and (f) using technology to make food information available on the nutrition and eating behaviors of foodservice venue patrons:

1. Employ a team of practitioners and researchers (e.g., social scientists, behavioral researchers, and nutritionists) to identify which of the above practices should be combined to be evaluated for effectiveness in foodservice venues. Plans for design and implementation may include but not be limited to the following:
    a) Implement stealth changes that help align food offerings with the Dietary Guidelines for Americans (see Appendices I, II, and III), along with using on-site menu labeling and providing an app for the food offerings within the venue. The implementation of these changes could be done in stages by addressing each venue and then moving on to the next.
    b) Present foodservice venues with an opportunity to innovate to comply with the developed plan at Military installation locations in order to retain their contracts.
    c) Give foodservice venues a reasonable time period to comply with the developed plan, perhaps employ a stepwise method (e.g., 50% compliance within 2 years, 75% compliance within 4 years, and complete compliance within 5 years).

d) Replace any companies not willing to comply with the developed plan.

Conclusion

Americans should be proud of the healthier foodservice practices movement currently employed across the Military landscape, as this movement assists Active Duty personnel and their families in living healthier lives and ultimately addressing, alleviating, and preventing the obesity epidemic. Nevertheless, more action is needed because obesity is a complex and multi-faceted public-health concern resulting from the interaction of social, cultural, and environmental factors that shape individuals' eating behaviors. Evidence-informed strategies and practices, along with evidence-based programs, must be employed if the DoD and the Military are going to address and solve this epidemic. The evidence-informed practices highlighted throughout this document provide direction on how to create an environment that encourages healthy eating behaviors among Service Members, families, civilian employees, and retirees.

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Appendices

Appendix I	Key Nutrition Recommendations from the 2010 Dietary Guidelines for Americans
Appendix II	Estimated Calorie Needs from the 2010 Dietary Guidelines for Americans
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Appendix I

Key Nutrition Recommendations from the 2010 Dietary Guidelines for Americans

Key Recommendations

BALANCING CALORIES TO MANAGE WEIGHT

- Prevent and/or reduce overweight and obesity through improved eating and physical activity behaviors.
- Control total calorie intake to manage body weight. For people who are overweight or obese, this will mean consuming fewer calories from foods and beverages.
- Increase physical activity and reduce time spent in sedentary behaviors.
- Maintain appropriate calorie balance during each stage of life—childhood, adolescence, adulthood, pregnancy and breastfeeding, and older age.

FOODS AND FOOD COMPONENTS TO REDUCE

- Reduce daily sodium intake to less than 2,300 milligrams (mg) and further reduce intake to 1,500 mg among persons who are 51 and older and those of any age who are African American or have hypertension, diabetes, or chronic kidney disease. The 1,500 mg recommendation applies to about half of the U.S. population, including children, and the majority of adults.
- Consume less than 10 percent of calories from saturated fatty acids by replacing them with monounsaturated and polyunsaturated fatty acids.
- Consume less than 300 mg per day of dietary cholesterol.
- Keep *trans* fatty acid consumption as low as possible by limiting foods that contain synthetic sources of *trans* fats, such as partially hydrogenated oils, and by limiting other solid fats.
- Reduce the intake of calories from solid fats and added sugars.
- Limit the consumption of foods that contain refined grains, especially refined grain foods that contain solid fats, added sugars, and sodium.
- If alcohol is consumed, it should be consumed in moderation—up to one drink per day for women and two drinks per day for men—and only by adults of legal drinking age.[5]

FOODS AND NUTRIENTS TO INCREASE

Individuals should meet the following recommendations as part of a healthy eating pattern while staying within their calorie needs.

- Increase vegetable and fruit intake.
- Eat a variety of vegetables, especially dark-green and red and orange vegetables and beans and peas.
- Consume at least half of all grains as whole grains. Increase whole-grain intake by replacing refined grains with whole grains.
- Increase intake of fat-free or low-fat milk and milk products, such as milk, yogurt, cheese, or fortified soy beverages.[6]
- Choose a variety of protein foods, which include seafood, lean meat and poultry, eggs, beans and peas, soy products, and unsalted nuts and seeds.
- Increase the amount and variety of seafood consumed by choosing seafood in place of some meat and poultry.
- Replace protein foods that are higher in solid fats with choices that are lower in solid fats and calories and/or are sources of oils.
- Use oils to replace solid fats where possible.
- Choose foods that provide more potassium, dietary fiber, calcium, and vitamin D, which are nutrients of concern in American diets. These foods include vegetables, fruits, whole grains, and milk and milk products.

Recommendations for specific population groups

Women capable of becoming pregnant[7]

- Choose foods that supply heme iron, which is more readily absorbed by the body, additional iron sources, and enhancers of iron absorption such as vitamin C-rich foods.
- Consume 400 micrograms (mcg) per day of synthetic folic acid (from fortified foods and/or supplements) in addition to food forms of folate from a varied diet.[8]

Women who are pregnant or breastfeeding[7]

- Consume 8 to 12 ounces of seafood per week from a variety of seafood types.
- Due to their high methyl mercury content, limit white (albacore) tuna to 6 ounces per week and do not eat the following four types of fish: tilefish, shark, swordfish, and king mackerel.
- If pregnant, take an iron supplement, as recommended by an obstetrician or other health care provider.

Individuals ages 50 years and older

- Consume foods fortified with vitamin B_{12}, such as fortified cereals, or dietary supplements.

BUILDING HEALTHY EATING PATTERNS

- Select an eating pattern that meets nutrient needs over time at an appropriate calorie level.
- Account for all foods and beverages consumed and assess how they fit within a total healthy eating pattern.
- Follow food safety recommendations when preparing and eating foods to reduce the risk of foodborne illnesses.

(United States Department of Agriculture and United States Department of Health and Human Services, 2010)

Appendix II

Estimated Calorie Needs from the

2010 Dietary Guidelines for Americans

TABLE 2-3. Estimated Calorie Needs per Day by Age, Gender, and Physical Activity Level[a]

Estimated amounts of calories needed to maintain calorie balance for various gender and age groups at three different levels of physical activity. The estimates are rounded to the nearest 200 calories. An individual's calorie needs may be higher or lower than these average estimates.

		Physical Activity Level[b]		
Gender	**Age (years)**	**Sedentary**	**Moderately Active**	**Active**
Child (female and male)	2–3	1,000–1,200[c]	1,000–1,400[c]	1,000–1,400[c]
Female[d]	4–8	1,200–1,400	1,400–1,600	1,400–1,800
	9–13	1,400–1,600	1,600–2,000	1,800–2,200
	14–18	1,800	2,000	2,400
	19–30	1,800–2,000	2,000–2,200	2,400
	31–50	1,800	2,000	2,200
	51+	1,600	1,800	2,000–2,200
Male	4–8	1,200–1,400	1,400–1,600	1,600–2,000
	9–13	1,600–2,000	1,800–2,200	2,000–2,600
	14–18	2,000–2,400	2,400–2,800	2,800–3,200
	19–30	2,400–2,600	2,600–2,800	3,000
	31–50	2,200–2,400	2,400–2,600	2,800–3,000
	51+	2,000–2,200	2,200–2,400	2,400–2,800

a. Based on Estimated Energy Requirements (EER) equations, using reference heights (average) and reference weights (healthy) for each age/gender group. For children and adolescents, reference height and weight vary. For adults, the reference man is 5 feet 10 inches tall and weighs 154 pounds. The reference woman is 5 feet 4 inches tall and weighs 126 pounds. EER equations are from the Institute of Medicine. Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids. Washington (DC): The National Academies Press; 2002.
b. Sedentary means a lifestyle that includes only the light physical activity associated with typical day-to-day life. Moderately active means a lifestyle that includes physical activity equivalent to walking about 1.5 to 3 miles per day at 3 to 4 miles per hour, in addition to the light physical activity associated with typical day-to-day life. Active means a lifestyle that includes physical activity equivalent to walking more than 3 miles per day at 3 to 4 miles per hour, in addition to the light physical activity associated with typical day-to-day life.
c. The calorie ranges shown are to accommodate needs of different ages within the group. For children and adolescents, more calories are needed at older ages. For adults, fewer calories are needed at older ages.
d. Estimates for females do not include women who are pregnant or breastfeeding.

(United States Department of Agriculture and United States Department of Health and Human Services, 2010)

Appendix III

Macronutrient, Mineral, and Vitamin

Nutritional Goals from the

2010 Dietary Guidelines for Americans

Nutrient (units)	Source of goal[a]	Child 1-3	Female 4-8	Male 4-8	Female 9-13	Male 9-13	Female 14-18	Male 14-18	Female 19-30	Male 19-30	Female 31-50	Male 31-50	Female 51+	Male 51+
Macronutrients														
Protein (g)	RDA[b]	13	19	19	34	34	46	52	46	56	46	56	46	56
(% of calories)	AMDR[c]	5-20	10-30	10-30	10-30	10-30	10-30	10-30	10-35	10-35	10-35	10-35	10-35	10-35
Carbohydrate (g)	RDA	130	130	130	130	130	130	130	130	130	130	130	130	130
(% of calories)	AMDR	45-65	45-65	45-65	45-65	45-65	45-65	45-65	45-65	45-65	45-65	45-65	45-65	45-65
Total fiber (g)	IOM[d]	14	17	20	22	25	25	31	28	34	25	31	22	28
Total fat (% of calories)	AMDR	30-40	25-35	25-35	25-35	25-35	25-35	25-35	20-35	20-35	20-35	20-35	20-35	20-35
Saturated fat (% of calories)	DG[e]	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%
Linoleic acid (g)	AI[f]	7	10	10	10	12	11	16	12	17	12	17	11	14
(% of calories)	AMDR	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10
alpha-Linolenic acid (g)	AI	0.7	0.9	0.9	1.0	1.2	1.1	1.6	1.1	1.6	1.1	1.6	1.1	1.6
(% of calories)	AMDR	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2	0.6-1.2
Cholesterol (mg)	DG	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300
Minerals														
Calcium (mg)	RDA	700	1,000	1,000	1,300	1,300	1,300	1,300	1,000	1,000	1,000	1,000	1,200	1,200
Iron (mg)	RDA	7	10	10	8	8	15	11	18	8	18	8	8	8
Magnesium (mg)	RDA	80	130	130	240	240	360	410	310	400	320	420	320	420
Phosphorus (mg)	RDA	460	500	500	1,250	1,250	1,250	1,250	700	700	700	700	700	700
Potassium (mg)	AI	3,000	3,800	3,800	4,500	4,500	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700
Sodium (mg)	UL[g]	<1,500	<1,900	<1,900	<2,200	<2,200	<2,300	<2,300	<2,300	<2,300	<2,300	<2,300	<2,300	<2,300
Zinc (mg)	RDA	3	5	5	8	8	9	11	8	11	8	11	8	11
Copper (mcg)	RDA	340	440	440	700	700	890	890	900	900	900	900	900	900
Selenium (mcg)	RDA	20	30	30	40	40	55	55	55	55	55	55	55	55
Vitamins														
Vitamin A (mcg RAE)	RDA	300	400	400	600	600	700	900	700	900	700	900	700	900
Vitamin D[h] (mcg)	RDA	15	15	15	15	15	15	15	15	15	15	15	15	15
Vitamin E (mg AT)	RDA	6	7	7	11	11	15	15	15	15	15	15	15	15
Vitamin C (mg)	RDA	15	25	25	45	45	65	75	75	90	75	90	75	90
Thiamin (mg)	RDA	0.5	0.6	0.6	0.9	0.9	1.0	1.2	1.1	1.2	1.1	1.2	1.1	1.2
Riboflavin (mg)	RDA	0.5	0.6	0.6	0.9	0.9	1.0	1.3	1.1	1.3	1.1	1.3	1.1	1.3
Niacin (mg)	RDA	6	8	8	12	12	14	16	14	16	14	16	14	16
Folate (mcg)	RDA	150	200	200	300	300	400	400	400	400	400	400	400	400
Vitamin B_6 (mg)	RDA	0.5	0.6	0.6	1.0	1.0	1.2	1.3	1.3	1.3	1.3	1.3	1.5	1.7
Vitamin B_{12} (mcg)	RDA	0.9	1.2	1.2	1.8	1.8	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Choline (mg)	AI	200	250	250	375	375	400	550	425	550	425	550	425	550
Vitamin K (mcg)	AI	30	55	55	60	60	75	75	90	120	90	120	90	120

[a] Dietary Guidelines recommendations are used when no quantitative Dietary Reference Intake value is available; apply to ages 2 years and older.
[b] Recommended Dietary Allowance, IOM.
[c] Acceptable Macronutrient Distribution Range, IOM.
[d] 14 grams per 1,000 calories, IOM.
[e] Dietary Guidelines recommendation.
[f] Adequate Intake, IOM.
[g] Upper Limit, IOM.
[h] 1 mcg of vitamin D is equivalent to 40 IU.
AT = alpha-tocopherol; DFE = dietary folate equivalents; RAE = retinol activity equivalents.

Sources:
Britten P, Marcoe K, Yamini S, Davis C. Development of food intake patterns for the MyPyramid Food Guidance System. J Nutr Educ Behav 2006;38(6 Suppl):S78-S92.
IOM. Dietary Reference Intakes: The essential guide to nutrient requirements. Washington (DC): The National Academies Press; 2006.
IOM. Dietary Reference Intakes for Calcium and Vitamin D. Washington (DC): The National Academies Press; 2010.

(United States Department of Agriculture and United States Department of Health and Human Services, 2010)

Appendix IV

Fact sheets from the

Resource Center for the Prevention of Military Child Obesity

at the Clearinghouse for Military Family Readiness

for Gimme 5-Atlanta, 5-A-Day Power Plus, CATCH, and HEALTHY Intervention Program

FACT SHEET

Resource Center for Child Obesity Prevention @
Clearinghouse for Military Family Readiness
Evidence-Based Programs

www.militaryfamilies.psu.edu
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GIMME 5-ATLANTA


Middle Childhood

PLACEMENT ON CONTINUUM OF EVIDENCE Promising

TARGET AUDIENCE

Gimme 5-Atlanta is for 4th and 5th grade students.

SUMMARY

Gimme 5-Atlanta is a school-based program designed to increase the consumption of fruits, juices, and vegetables by 4th and 5th grade students.

EVIDENCE

Gimme 5-Atlanta was developed and evaluated by a team of researchers at Emory University. The original version was tested in a randomized controlled trial (RCT) with two elementary schools and revisions were made. The revised program was analyzed in an RCT involving 16 elementary schools. The program researchers observed that, in comparison to students at control schools not implementing the program, student participants: (1) consumed more total fruit, juice, and vegetable servings per day, (2) consumed more vegetable servings per day, (3) reported more asking behaviors (i.e., requests to family members for increased fruit, juice, and/or vegetable availability or accessibility), and (4) had more knowledge about fruits, juices, and vegetables with respect to serving recommendations, setting goals for consumption, and strategies for including more servings in the diet.

The overall difference in fruit, juice, and vegetable consumption between control and participant students was small (i.e., 0.2 servings per day), and occurred because student participants did not experience an age-related decline in fruit, juice, and vegetable consumption to the same extent as control students over the course of the study.

COMPONENTS

The Gimme 5-Atlanta curriculum includes 12 lessons for 4th grade that emphasize vegetables and 12 lessons for 5th grade that focus on fruits and juices. Each lesson was designed to be taught by classroom teachers in 45-55 minutes, and includes activities such as role-playing and preparing and sampling foods. Lessons focus on developing student ability to ask for fruits, juices, and vegetables at home and in restaurants, increasing student preference for fruits, juices and vegetables, training students to prepare fruits, juices, and vegetables for meals and snacks, developing student goal-setting skills, and enhancing student problem-solving skills for occasions when goals are not met. Newsletters and videos sent home contain activities and information to encourage families to reinforce lessons learned in the classroom.


Obesity


School-based


Nutrition/Diet


Education


Behavior Modification

PREVIOUS USE

We were unable to determine how extensively this program has been used. The current version of the Gimme 5-Atlanta program was implemented by eight elementary schools in the mid-1990s during an RCT.

PENNSTATE Cooperative Extension College of Agricultural Sciences

USDA

This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, and the Office of Family Policy, Children, and Youth, U.S. Department of Defense under Award No. 2010-48709-21867 developed in collaboration with The Pennsylvania State University.

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GIMME 5-ATLANTA

TRAINING

There are no training requirements for this program, however teachers using the curriculum will want to familiarize themselves with the lessons prior to their implementation.

CONSIDERATIONS

Implementation of Gimme 5-Atlanta will require a buy-in from school administrators and teachers, time to implement curricular activities within the school day, and funds to purchase produce and other lesson materials. Some materials for this program are out of date – they do not reflect changes in how portion size of fruits and vegetables are communicated in current public health campaigns (i.e., USDA's MyPlate program).

The Clearinghouse can help address these considerations. Please call 1-877-382-9185, or email Clearinghouse@psu.edu

IMPLEMENTATION

If you are interested in implementing Gimme 5-Atlanta, the Clearinghouse is interested in helping you! Please call 1-877-382-9185, or email Clearinghouse@psu.edu

TIME

A total of 12 lessons, each lasting 45-55 minutes, are delivered by classroom teachers over the course of 6 weeks.

COST

The curriculum is available for free from the National Cancer Institute at http://rtips.cancer.gov/rtips/productDownloads.do?programId=167779 and the cost of produce for use in lessons is variable.

EVALUATION PLAN

To move Gimme 5-Atlanta to the Effective category on the Clearinghouse Continuum of Evidence at least one evaluation should be performed demonstrating positive effects lasting at least two years from the beginning of the program or at least one year from program completion, and at least one external evaluation must be conducted that demonstrates sustained, positive outcomes. This study must be conducted independent of the program developer.

The Clearinghouse can help you develop an evaluation plan to ensure the program components are meeting your goals. Please call 1-877-382-9185, or email Clearinghouse@psu.edu

CONTACT

To contact the Clearinghouse about this program, please call 1-877-382-9185, or email Clearinghouse@psu.edu

You can also contact the National Cancer Institute's Research-Tested Intervention Program unit using their "contact us" webform at http://rtips.cancer.gov/rtips/contact.do

The information from this fact sheet was excerpted from http://rtips.cancer.gov/rtips/programDetails.do?programId=167779

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USDA

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5-A-Day Power Plus


Middle Childhood

PLACEMENT ON CONTINUUM OF EVIDENCE Promising

TARGET AUDIENCE

The 5-A-Day Power Plus program is for students in 4th and 5th grades.

SUMMARY

The 5-A-Day Power Plus program is a school-based intervention that aims to increase fruit and vegetable consumption among 4th and 5th grade students.

EVIDENCE

A randomized controlled study of 20 schools revealed that students participating in the program significantly increased their fruit and vegetable consumption. During school lunch, students ate 0.47 more total fruit and vegetable servings, and 0.30 more total fruit servings, and girls ate 0.26 more total vegetable servings. Overall dietary changes assessed using a 24-hour recall included an increase in the consumption of fruit by 0.62 servings.

COMPONENTS

The 5-A-Day Power Plus program involves classroom-based and school lunch-based interventions as well as family and corporate involvement. In the classroom, 4th and 5th grade curricula include 16 lessons to be delivered twice a week over the course of 8 weeks. Lessons target skill-building and problem-solving, and include snack preparation and taste testing. At school lunch, the variety and attractiveness of fruit and vegetable choices are improved, students engage in competitions to increase their fruit and vegetable consumption, and classroom curricula are complemented with point-of-purchase fruit and vegetable promotions that make use of curricular messages. Fourth grade students bring home a series of information/activity packets to complete with their parents and 5th grade students bring home "snack packs" to prepare fruit- and vegetable-based snacks for their families. Fruit and vegetable corporations supply produce for the snack packs, school lunches, and in-class taste tests, and a guest speaker for the classroom.


Obesity


School-based


Behavior Modification


Education


Nutrition/Diet

PREVIOUS USE

We were unable to determine how extensively this program has been used. The 5-A-Day Power Plus program was first tested in schools in the Twin Cities region of Minnesota beginning in 1995.

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USDA

This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, and the Office of Family Policy, Children, and Youth, U.S. Department of Defense under Award No. 2010-48709-21867 developed in collaboration with The Pennsylvania State University.

FACT SHEET

Resource Center for Child Obesity Prevention @
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5-A-Day Power Plus

TRAINING

An implementation manual is available at http://rtips.cancer.gov/rtips/programDetails.do?programId=209461 that includes materials for a six-hour teacher training and a one-hour food service employee training. Trainings can be held on-site using these materials.

CONSIDERATIONS

Implementing the program will require school administrator support, a buy-in from classroom teachers and school food service employees, and time to teach the curricula during the school day. Schools may need funding to purchase produce to supplement what is available through food services. Creating a partnership with local produce suppliers who can provide produce and serve as guest speakers would enhance the program. Some materials for this program are out of date – they do not reflect changes in how portion size of fruits and vegetables are communicated in current public health campaigns (i.e., USDA's MyPlate program).

The Clearinghouse can help address these considerations. Please call 1-877-382-9185, or email Clearinghouse@psu.edu

IMPLEMENTATION

If you are interested in implementing 5-A-Day Power Plus, the Clearinghouse is interested in helping you! Please call 1-877-382-9185, or email Clearinghouse@psu.edu

TIME

The program includes 16 45-minute lessons delivered over 8 weeks.

COST

Program materials are available for free at http://rtips.cancer.gov/rtips/programDetails.do?programId=209461 The cost to implement the program has been estimated at $8-10 per student participant.

EVALUATION PLAN

To move 5-A-Day Power Plus to the Effective category on the Clearinghouse Continuum of Evidence at least one evaluation should be performed demonstrating positive effects lasting at least two years from the beginning of the program or at least one year from program completion, and at least one external evaluation must be conducted that demonstrates sustained, positive outcomes. This study must be conducted independent of the program developer.

The Clearinghouse can help you develop an evaluation plan to ensure the program components are meeting your goals. Please call 1-877-382-9185, or email Clearinghouse@psu.edu

CONTACT

To contact the Clearinghouse about this program, please call 1-877-382-9185, or email Clearinghouse@psu.edu

You can also contact the National Cancer Institute's Research-Tested Intervention Program unit using their "contact us" webform at http://rtips.cancer.gov/rtips/contact.do

The information from this fact sheet was excerpted from http://rtips.cancer.gov/rtips/programDetails.do?programId=209461

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Coordinated Approach to Child Health (CATCH)


Middle Childhood

PLACEMENT ON CONTINUUM OF EVIDENCE Promising

TARGET AUDIENCE

CATCH is for children in Kindergarten through 8th grade.

SUMMARY

CATCH is a coordinated school health program designed to improve physical activity and nutrition patterns as well as prevent and reduce tobacco use. The program includes components for the classroom, physical education class, cafeteria, and home environment.

EVIDENCE

A large, four-site randomized controlled trial showed that CATCH schools were successful in improving cafeteria food (i.e., reducing total calories and % calories from fat and saturated fat), PE classes (i.e., increasing time spent in vigorous and moderate-to-vigorous physical activity), and students' health behavior/knowledge. Three years later, some of these changes were maintained. The program did not have any effect on physiological outcomes (e.g., weight status and blood pressure). An independent team implementing the program in a predominantly low-income, Hispanic school setting demonstrated that CATCH participation resulted in marked reductions in the prevalence of overweight in boys and girls. Additional studies that include children in Kindergarten through 8th grade (versus just 3rd through 5th grades) are needed to fully evaluate program effectiveness.

COMPONENTS

CATCH is a coordinated school health program with the following components:

- Classroom: The CATCH Go for Health component is a health education curriculum providing information and skill-building activities to promote healthy eating, physical activity, and tobacco avoidance;
- Physical Education (PE): The CATCH PE component is designed to increase the amount of time students spend in moderate-to-vigorous level physical activity in PE class;
- Cafeteria: The Eat Smart component aims to reduce the total fat, saturated fat, and sodium content of foods served at breakfast and lunch and to provide education to students so they choose healthier foods; and
- Home: The CATCH Family component provides the family with activity packets promoting healthy eating, physical activity, and tobacco avoidance.

PREVIOUS USE

According to the developer, over 8,500 schools have implemented CATCH in school and after-school programs.

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USDA

This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, and the Office of Family Policy, Children, and Youth, U.S. Department of Defense under Award No. 2010-48709-21867 developed in collaboration with The Pennsylvania State University.

FACT SHEET

Resource Center for Child Obesity Prevention @
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Evidence-Based Programs

Coordinated Approach to Child Health (CATCH)

TRAINING

CATCH training workshops provide information on the program and time to practice skills needed to implement the program. A $595 per person training fee includes: (1) three days of CATCH training; (2) continental breakfast and lunch daily; (3) CATCH training packet; (4) training certificate and t-shirt; (5) CATCH newsletter; and (6) 10% discount on CATCH curricula and equipment.

CONSIDERATIONS

This intervention requires involvement of many staff within a school, including administrators, classroom teachers, PE teachers, and food service employees. Extensive planning, support, and financial resources are needed to implement this program.

The Clearinghouse can help address these considerations. Please call 1-877-382-9185, or email Clearinghouse@psu.edu

IMPLEMENTATION

If you are interested in implementing CATCH, the Clearinghouse is interested in helping you! Please call 1-877-382-9185, or email Clearinghouse@psu.edu

TIME

Class time will need to be diverted to 15-24 health education lessons lasting 30-40 minutes each. PE, cafeteria, and home components take minimal additional school time.

COST

Evidence-based prevention programs are cost-effective as determined by Washington State Institute for Public Policy (2004). For every dollar spent on the implementation of CATCH, there is a return on investment of $900. The K-8 curriculum package for classroom and PE components costs $1,075. The cafeteria curriculum costs $25. Prices for additional resources and products, including items sold separately, are at www.flaghouse.com

EVALUATION PLAN

This program has been placed Promising because the independent evaluation was a quasi-experimental design. Positive study outcomes must be demonstrated in a randomized controlled trial conducted independent of the program developer for this program to be placed Effective. Ideally, the study should test outcomes across the entire age range served by the program.

The Clearinghouse can help you develop an evaluation plan to ensure the program components are meeting your goals. Please call 1-877-382-9185, or email Clearinghouse@psu.edu

CONTACT

To contact the Clearinghouse about this program, please call 1-877-382-9185, or email Clearinghouse@psu.edu

You can also contact CATCH by calling 1-800-793-7900 or by emailing Help@CATCHInfo.org

The information from this fact sheet was excerpted from http://catchinfo.org/catch-for-schools/

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USDA

This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, and the Office of Family Policy, Children, and Youth, U.S. Department of Defense under Award No. 2010-48709-21867 developed in collaboration with The Pennsylvania State University.

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HEALTHY INTERVENTION PROGRAM


Middle Childhood

PLACEMENT ON CONTINUUM OF EVIDENCE Promising

TARGET AUDIENCE

The HEALTHY Intervention Program is for children in 6th to 8th grade who are at high risk for Type 2 diabetes and obesity.

SUMMARY

The Healthy Intervention program is a multi-component school-based program that improves the school's food environment, increases physical activity, provides education on behavior change, and motivates students through social marketing.

EVIDENCE

A large randomized controlled trial involving 42 middle schools found that the intervention group as a whole experienced a slight reduction in weight status (BMI z-score), the prevalence of high waist circumference values, and fasting insulin as compared to the control group. The high-risk portion of the intervention group also had a reduction in the rate of obesity as compared to the control group. These improvements were modest, but the study targeted schools with high rates of overweight, obesity, and poverty.

COMPONENTS

The Healthy Intervention program is a school-based intervention with four primary components:

- Nutrition: The entire food environment (e.g., cafeteria, vending, and school fundraisers) is modified to reduce fat, provide more fruits and vegetables, serve only healthy beverages, and serve more whole grains.
- Physical Activity: At least 225 minutes of Physical Education are provided per 10 day period.
- Behavior Modification: The Fun Learning Activities for Student Health (FLASH) program incorporates activities into science, health, and homeroom class sessions. FLASH includes ten 30-minute classroom lessons per semester that address behavior modification skills and peer influence on behavior.
- Social Marketing: Schools hang posters, provide incentive such as water bottles and t-shirts, and offer special events around the HEALTHY intervention themes.

In the primary research study of this program, students began participating in the program at the start of 6th grade and continued to receive program components until the end of 8th grade. Booster activities were provided to keep students motivated during summer and winter breaks.

PREVIOUS USE

The HEALTHY Study included over 4,000 children from 7 sites across the country. The schools served low-income, minority populations (Hispanic and African American children) where approximately 50% of children were either overweight or obese.

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USDA

This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, and the Office of Family Policy, Children, and Youth, U.S. Department of Defense under Award No. 2010-48709-21867 developed in collaboration with The Pennsylvania State University.

FACT SHEET

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Evidence-Based Programs

HEALTHY Intervention Program

TRAINING

No training is required, nor is it currently available. Teaching manuals are available for free online.

CONSIDERATIONS

This intervention requires involvement of many staff within a middle school – administrators, classroom teachers, physical education teachers, specials teachers, and food service employees. Extensive planning and support is needed to implement this intensive program. Given it is administered within the school day, children will have fewer barriers to participating than with after-school programs.

The Clearinghouse can help address these considerations. Please call 1-877-382-9185, or email Clearinghouse@psu.edu

IMPLEMENTATION

If you are interested in implementing The HEALTHY Intervention Program, the Clearinghouse is interested in helping you! Please call 1-877-382-9185, or email Clearinghouse@psu.edu

TIME

Weekly behavioral modification lessons last for 30 minutes. At least 225 minutes of physical education are provided over a 10 day period.

COST

All teaching manuals, posters, and activities are free online at http://healthystudy.org/materialsmatrix.htm

EVALUATION PLAN

To move The HEALTHY Intervention Program to the Effective category on the Clearinghouse Continuum of Evidence at least one external evaluation must be conducted that demonstrates sustained, positive outcomes. This study must be conducted independent of the program developer.

The Clearinghouse can help you develop an evaluation plan to ensure the program components are meeting your goals. Please call 1-877-382-9185, or email Clearinghouse@psu.edu

CONTACT

To contact the Clearinghouse about this program, please call 1-877-382-9185, or email Clearinghouse@psu.edu

You can also contact The HEALTHY Study lead scientist, Dr. Gary Foster, at the Center for Obesity Research and Education, Temple University, by calling 1-215-707-8632 or by emailing gary.foster@temple.edu

The information from this fact sheet was excerpted from http://healthystudy.org/index.htm

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USDA

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